
EVALUATION OF IMPACTS OF THE RURAL SERVICE DELIVERY PARTNERSHIP (RSDP)

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Associates for Community and
Population Research
Dhaka, Bangladesh



MEASURE *Evaluation*
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Abstract

Data from the 2001 Rural Service Delivery Partnership (RSDP) Evaluation Survey indicate that the project has had positive effects on the health and health care seeking behaviors of the targeted populations. Much of this impact analysis focuses on quantifying key changes in the use of essential services since the 1998 Baseline Survey and identifying the pathways through which those changes have occurred.

Key Findings:

- The RSDP program is responsible for substantial increases in antenatal care use. Simulations indicate that the project is responsible for an 8.6 percentage point increase in antenatal care, an 8.6 percentage point increase in the number of pregnant women with two or more tetanus toxoid injections, and a 3.3 percentage point increase in use of modern contraception from 1998 to 2001. For child health outcomes, the impact of the project is smaller.
- The effects of price on the use of services at RSDP clinics and depotholders are generally small, indicating that higher prices are not significant deterrents to care. Distance, on the other hand, appears to be a significant determinant of overall use of antenatal care and of RSDP providers for antenatal care and modern contraception.
- Multilevel analyses indicate that the RSDP provider characteristics generally do not have significant impacts on the likelihood of their use, with the exceptions of distance, satellite clinic worker experience, and service availability.

1. Background

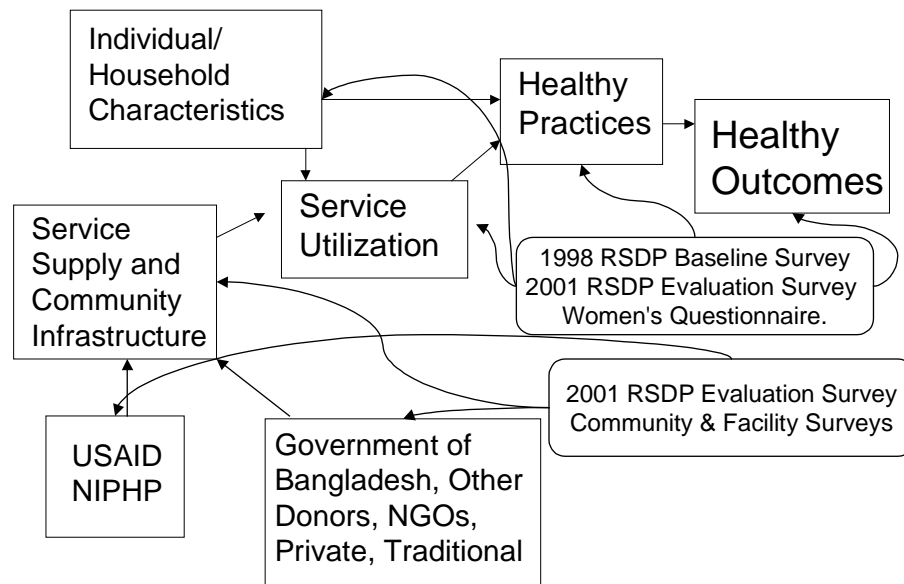
The 2001 Rural Service Delivery Partnership (RSDP) Evaluation Survey was designed to evaluate the performance of the RSDP program in delivering an Essential Service Package (ESP) of primary health care interventions. These interventions were provided through a network of static clinics and satellite clinics and depotholders aimed at underserved rural populations of Bangladesh. The survey collected information from 12,747 women – 9,625 in rural areas which the program described as their catchment areas and 1,780 women in rural non-catchment comparison areas. Women reported information on fertility and birth histories, awareness and use of family planning and reproductive health services and use of basic child health services. Data were also collected from community and village leaders on the presence of different types of health providers, including government hospitals and clinics, RSDP facilities, nongovernmental and private clinics, pharmacies, and private and traditional doctors, that serve their communities. From these community surveys, facilities were identified for more complete interviews, in which

data were collected on staffing, service availability, age, equipment availability and stockouts, and supervision.

This evaluation uses several different types of analyses to determine the impact of the RSDP program in improving the health of the population in their catchment areas. These analyses – and the data sources involved – are depicted in Figure 1. First, data from the Women’s Questionnaires collected in the 2001 RSDP Evaluation Survey are combined with similar data from the 1998 RSDP Baseline Survey conducted in the first year of the RSDP program. The advantage of the pooled data is that they can be used to determine whether improvements have been noted from 1998 to 2001 in the use of essential health services, in healthy practices, and in key health outcomes. Multilevel regression analysis is used to control for the influence of other factors and for secular trends in health outcomes.

A second type of analysis combines the 2001 RSDP Evaluation Survey Women’s Questionnaire data with data on the facilities serving those communities collected in the 2001 Facility Survey. These data include Global Positioning System (GPS) data on both facility and cluster locations. Women in RSDP areas are linked to the closest of different types of health facilities, including the closest RSDP static and satellite clinics. Similar linkages can be made for women in non-RSDP areas with the health facilities in their areas. Multilevel Regression Analysis can then be used to estimate the relative impacts of both facility characteristics (RSDP or other ownership, proximity, service availability, quality) and of household and women’s characteristics (wealth, education, religion, autonomy) on service utilization and health outcomes. This latter analysis has the advantage of determining precisely which factors are most important in affecting the health of the project population and of determining the impact of RSDP facilities relative to other sources of care. A more complete analysis using pooled 1998 and 2001 data, however, is not possible since no facility-level information was collected in 1998. Further, by collecting information on populations and services in areas served both by the RSDP program and in areas without the RSDP program, the relative contribution of the RSDP program to any changes can be evaluated.

Figure 1.1 Linking Inputs to Outcomes for Evaluating RSDP Program Impact (Simplified Framework)



The next section provides additional background on the 2001 RSDP Survey. That section includes results on proximity to health services by the project population. The third section presents trends in health behaviors and health outcomes from 1998 to 2001. The fourth section presents results of the multilevel regression analysis of use of modern contraception and antenatal care and awareness of basic types of health facilities.

2. Methodology

The 2001 RSDP Evaluation Survey was conducted by the Associates for Community and Population Research (ACPR), a Dhaka-based, data-collection firm. Technical assistance was provided by the MEASURE *Evaluation* Project. Fieldwork was undertaken from June to September 2001. The survey collected information from 9,625 women in rural areas which the program described as their catchment areas and 1,780 women in rural non-catchment comparison areas. The 1998 RSDP Baseline Survey was also conducted by ACPR. The latter survey was conducted in late 1998 and early 1999 and collected information from 46,616 women in RSDP project areas and 8,743 women in non-project areas. Information was collected on the use of essential health services and awareness of RSDP clinics and services. No community or facility surveys were conducted in 1998.

Comparison areas for the 2001 Survey were chosen from the sample of comparison areas in the 1998 Baseline Survey. In the 1998 Baseline Survey, comparison areas were chosen from areas adjacent to every fifth selected RSDP cluster.

For every selected cluster from RSDP and comparison areas, 150 to 350 households were listed, proceeding from the northwest corner of the area. Then 35 to 38 households were systematically selected from each cluster, with the expectation that at least 30 eligible women (ever married aged 10 to 49 years) would be found to interview.

A fuller description of the 2001 RSDP Evaluation Survey is provided in *2001 Rural Service Delivery Partnership Evaluation Survey Report*.

Facility Survey

A detailed protocol was employed for collecting the community, facility and satellite clinic information, based on reports by community leaders on the availability of services in the Community Survey.

Overall, 746 facility interviews were conducted. Of these, 629 were in RSDP areas and 117 were in non-RSDP areas (Table 2.1). The largest number of facilities were surveyed in Dhaka division (218). Family Welfare Centres were the most commonly surveyed facilities (181) in RSDP areas, followed by RSDP Static Clinics (130) and Thana Health Centers (126). While the selection algorithm called for at least one RSDP static clinic to be surveyed for each cluster, the proximity of many of the clusters meant that many RSDP static clinics served multiple clusters and therefore fewer interviews were required than the number of clusters.

Table 2.1 Number of Facilities Surveyed by Type and by Division and RSDP/Non-RSDP Areas

Facility	Project Areas					Total	Non-Project Areas
	Chittagong	Khulna/Barisal	Dhaka	Rajshahi	Sylhet		
Hospital	5	7	16	14	4	46	2
Thana Health Center	16	13	46	36	15	126	17
Family Welfare Center	22	24	57	50	28	181	56
MCWC	2	3	5	4	3	17	3
RSDP Static Clinic	16	14	46	35	19	130	15
Private Clinic	6	9	17	9	4	45	7
Other NGO Clinic	0	2	8	5	4	19	4
Community Clinic	1	6	5	11	1	24	3
Rural Dispensary	4	3	18	12	4	41	10
Total	72	81	218	176	82	629	117

In addition, 387 interviews with satellite clinic workers were also conducted. Of these, 316 (82 percent) were RSDP satellite clinics, 70 (18 percent) were government-owned, and 1 was another NGO satellite clinic. As with fixed-site clinics, the greatest number of satellite clinics were located in Dhaka division (107), followed by Rajshahi (68) and Sylhet (57). Only 15 government/NGO satellite clinics were surveyed in RSDP areas. The majority (56) were located in the non-RSDP comparison areas.

In addition to the facility and satellite clinic interviews, 363 interviews were conducted with depotholders (Table 2.2). Nearly one-third of all depotholders who were interviewed were in Dhaka division. All but one was an RSDP depotholder. The single non-RSDP depotholder was a government depotholder. There were 8 depotholders in non-RSDP areas.

Table 2.2 Distribution of Depotholders by Division, RSDP/non-RSDP areas

Division	N	Pct.
Chittagong	47	13.0%
Khulna/Barisal	47	13.0%
Dhaka	115	31.7%
Rajshahi	84	23.1%
Sylhet	62	17.1%
Total RSDP Areas	62	97.8%
Non-Project Areas	8	2.2%

Interviews were also conducted with workers at the various health facilities. Overall, 1,850 worker interviews were conducted. These do not form part of the current analysis.

Proximity to Health Care Services

Global Positioning Systems (GPS), which pinpoint the locations of households and health care facilities, permit assessments of the relative accessibility of basic health services in RSDP and non-RSDP areas.

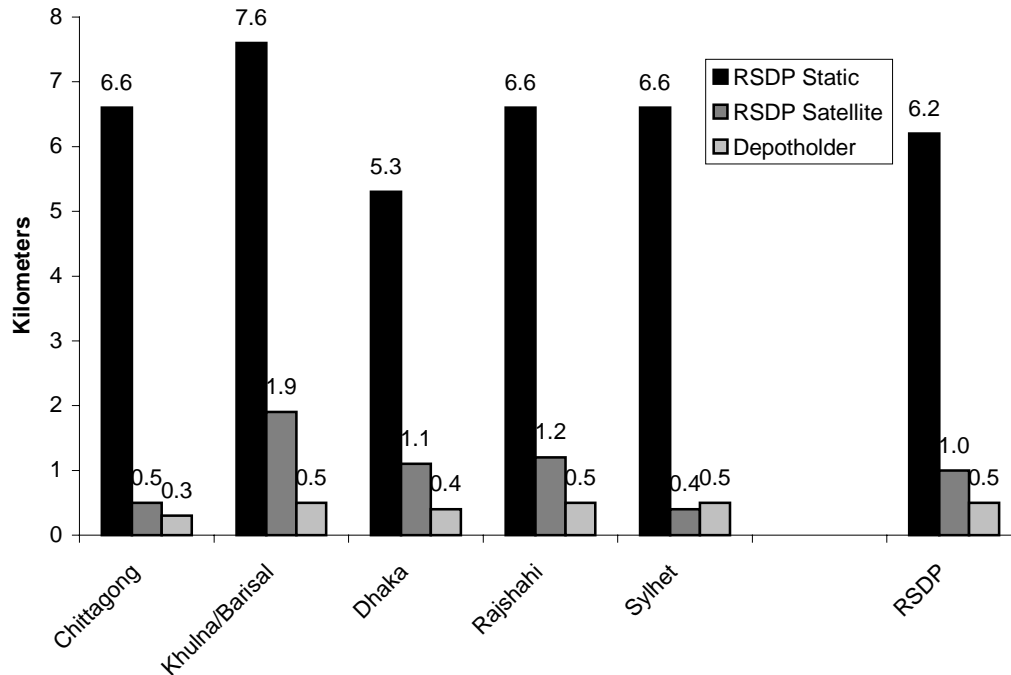
The vast majority of the population of RSDP areas is within 1 kilometer of an RSDP satellite clinic and an RSDP depotholder. In fact, 79.7 percent and 73.1 percent of populations in RSDP areas are within 0.5 kilometer of an RSDP satellite clinic and an RSDP depotholder respectively. Approximately 90 percent of RSDP populations are within 1 kilometer. As RSDP static clinics are less numerous, populations are not as close to static clinics. Only 10 percent of RSDP populations are within 1 kilometer and only 44 percent are within 5 kilometers.

Table 2.3 Percent of RSDP Populations within Specified Distances of RSDP Facilities

	Distance to Closest RSDP Facility				
	0.5 km	1 km	2.5km	5 km	10 km
Static Clinic	5.5%	9.7%	19.9%	43.9%	82.3%
Satellite Clinic	79.7%	87.1%	89.0%	93.2%	97.7%
Depotholder	73.1%	90.5%	96.5%	99.0%	100.0%

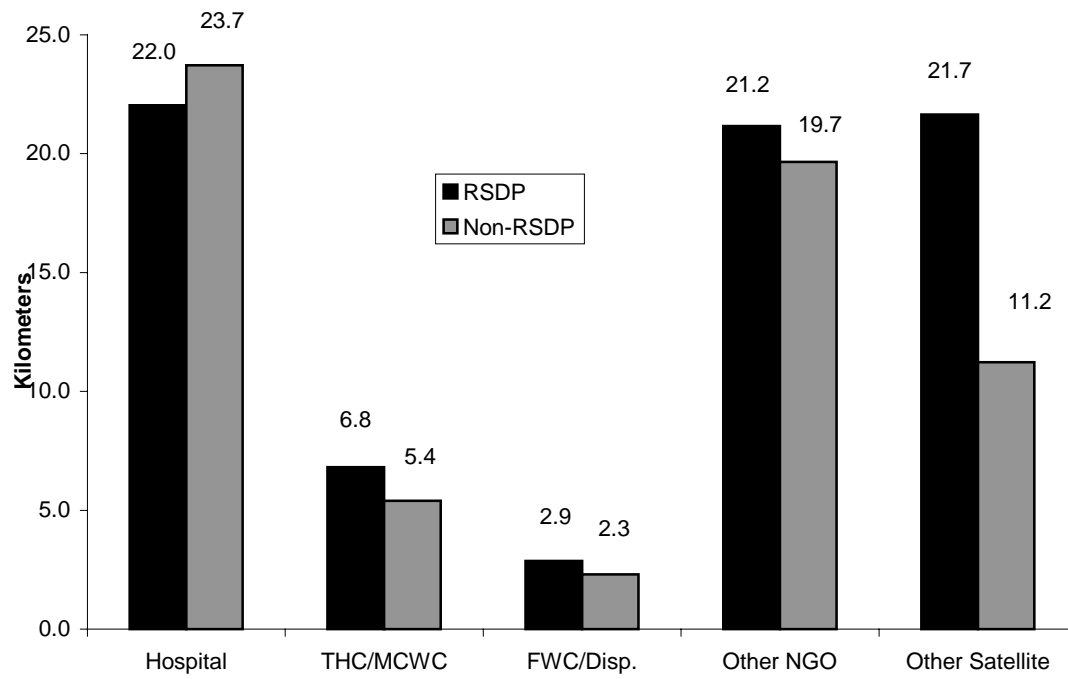
On average, individuals in RSDP areas are 6.2 kilometers from the nearest RSDP static clinic, 1.0 kilometer from the nearest RSDP satellite clinic and 0.5 kilometers from the nearest RSDP depotholder (Figure 2.1). RSDP facilities are slightly less accessible in Khulna/Barisal; individuals are 7.6 kilometers and 1.9 kilometers from the nearest RSDP static and satellite clinics, respectively. Individuals are closest to static clinics, 5.3 kilometers on average, in Dhaka division. Access to depotholders is relatively equal across the different divisions, ranging from 0.3 kilometers to the closest depotholder in Chittagong to 0.5 kilometers to the nearest depotholder in Khulna/Barisal, Rajshahi and Sylhet.

Figure 2.1 Mean Distances (Kilometers) to Nearest RSDP Facility by Type and Division



RSDP areas have less access to other types of health care facilities, particularly government facilities. This is as intended, because the stated objective for placement of RSDP facilities was in areas that were “under-served” by other health care providers. As compared with individuals in non-RSDP areas, individuals in RSDP areas are on average 1.4 kilometers farther from the closest government Thana Health Clinic or Maternal and Child Welfare Center (MCWC), 0.6 kilometers farther from the nearest Family Welfare Center (FWC)/Rural Dispensary/Community Clinic, 1.5 kilometers from the closest other NGO clinic, and 10.5 kilometers farther from the next closest satellite clinic.

Figure 2.2 Mean Distances to Nearest Facilities by Type and RSDP/non-RSDP areas



3. Trends

Main Findings:

- Comparisons with the 1998 Baseline Survey indicate significant increases in the use of essential health services in general and RSDP providers specifically. For several services, RSDP providers appear to be the main reasons for the increases. For both ANC and Vitamin A, increases were observed only in RSDP areas, not comparison areas. For other services, such as use of modern contraception, in which increases in use were identical in both RSDP and non-RSDP areas, the importance of RSDP providers as a share of total use increased.
- For some services, particularly those related to children's curative care, little change since 1998 and little impact of RSDP have been observed.
- Awareness of RSDP services – at both satellite and static clinics – has increased since 1998.

The 1998 Baseline Survey provides a benchmark against which to make judgments regarding the impact of the RSDP in affecting improvements in health and health-care seeking behavior among the urban populations that the project is intended to serve. The evaluation is enhanced by the design of the evaluation surveys: we have a sample of individuals living in areas served by RSDP facilities and, for comparison, a sample of individuals in similar communities that the project reports as not being served by the RSDP program. The purpose of the latter group is to act as a comparison group and to isolate whether observed changes in behavior among individuals in RSDP areas, if any, reflect the effects of the project. If changes in project areas are mirrored by similar sized changes in non-project areas, then improvements may be due to other factors in the country at large rather than to the project, unless project efforts have been mirrored by similar efforts from other groups elsewhere. Fortunately, a comparison group was included in the sample of the 1998 Baseline Survey. In 2001, a comparison group was drawn from the 1998 comparison group sample.

We are also interested in discerning whether any increases over time in the use of RSDP services represent expansion of services to new or previously underserved users or whether increases in the use of RSDP services represent individuals who have switched from other providers of care. Such distinctions may seem trivial, but they are important for a proper evaluation of the project. As one of the stated objectives of the RSDP program is to increase “use of high-impact elements of an ‘Essential Service Package’ among target populations,” any increase in RSDP services that comes solely from individuals who have switched from other providers could leave overall utilization rates of essential services unchanged among target populations. That being said, some degree of switching may reflect changes over time in the availability of alternative providers, such as Family Welfare Assistants (FWAs), and increased use of RSDP services could reflect the filling of an increasing void left by other providers. On the other hand, the project comes closer to fulfilling one of its major objectives if increases in the use of

RSDP services represent increased use of basic services by individuals who previously would have chosen not to use any services or were unaware that such services existed.

For this reason, many of the graphs below incorporate information both on the proportion of selected populations using essential services and the share of the different health care providers in providing those services. Thus, it is more readily apparent whether changes reflect switching providers, with an overall similar utilization rate, or a general increase in utilization with various increases for different providers.

Overall, use of modern contraception by married women in RSDP areas increased by 4.1 percentage points, from 36.5 percent in 1998 to 40.4 percent in 2001 (Figure 3.1a). A considerable portion of this increase appears to have been filled by RSDP providers, who saw an increase of 5.7 percentage points – from 12.2 percent to 17.9 percent – in the proportion of married women using modern contraceptives from RSDP providers. This increase in RSDP provision helped offset a decrease in provision by government providers, which catered to 17.2 percent of married women in 1998 but only 13.7 percent of women in 2001. Pharmacies also helped to offset the decline by public providers.

Use of modern contraception in non-RSDP areas increased by a similar amount – 4.0 percentage points – between 1998 and 2001 as that observed in RSDP areas. However, this increase was almost entirely borne by increased use of pharmacies. A much smaller decrease in the proportion of women using government providers – only 2.2 percentage points – was observed in non-RSDP areas. Oddly, even in non-RSDP areas, RSDP providers experienced an increase in the use of modern contraception from 0.3 percent to 1.8 percent of married women.

Figure 3.1a Distribution of Sources of Contraceptive Supply in RSDP Areas, 1998 and 2001

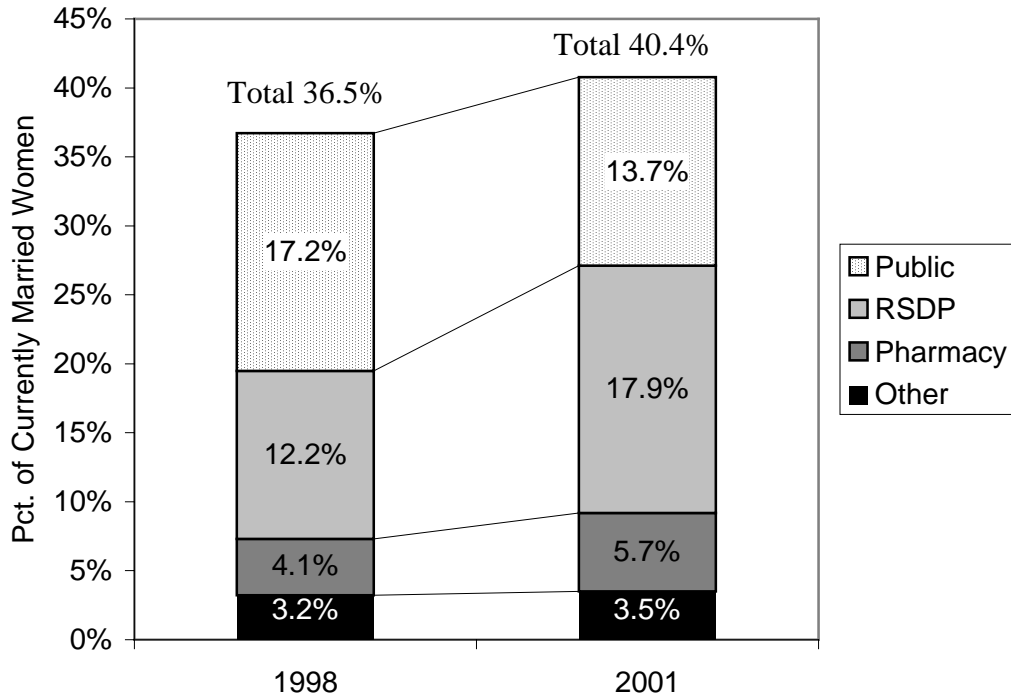
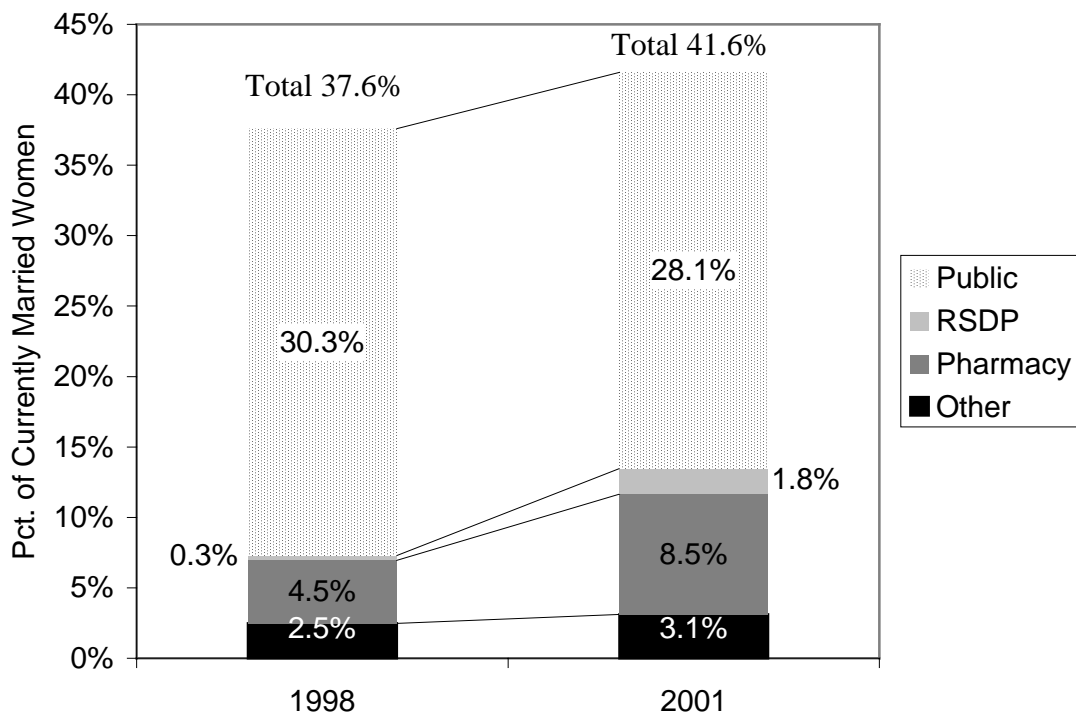


Figure 3.1b Distribution of Sources of Contraceptive Supply in Non-RSDP Areas, 1998 and 2001



In RSDP areas, use of antenatal care by women with births in the 12 months preceding the survey increased by 7.5 percentage points, from 39.3 percent in 1998 to 46.8 percent in 2001 (Figure 3.2a). Much of this increase would seem to be attributable to the project, as use of RSDP providers increased by 9.1 percentage points, from 18.3 percent to 27.4 percent of women. This increase was not matched by significantly increased use of any other types of health care providers and, in fact, offset a two-percentage point decrease in use of government providers.

In contrast to the situation in RSDP areas, use of antenatal care actually decreased in non-RSDP areas, from 42.6 percent of pregnant women in 1998 to 39.1 percent in 2001 (Figure 3.2b). This decrease might have been even larger had RSDP providers not experienced an increase of 4 percentage points in use by non-RSDP individuals from 1998 to 2001. Women in non-RSDP areas significantly reduced their use of government providers of antenatal care, from 30.6 percent of women in 1998 to 21.0 percent of women.

Figure 3.2a Sources of Antenatal Care in RSDP Areas for births in 12 months preceding the survey, 1998 and 2001

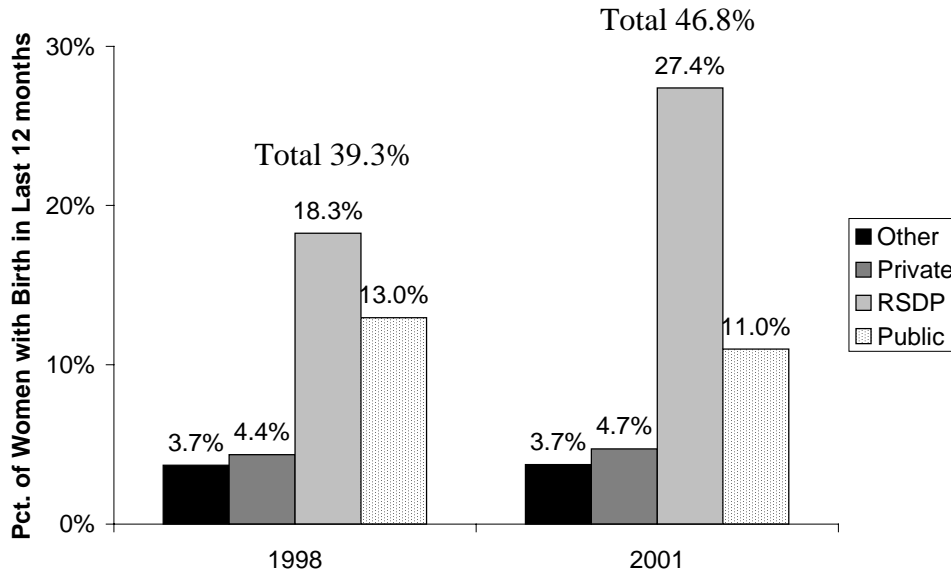
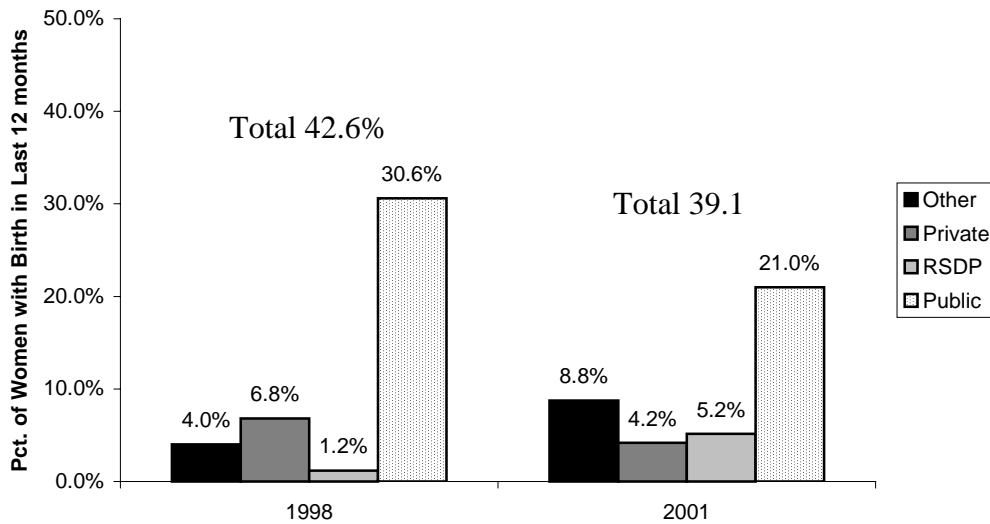


Figure 3.2b Sources of Antenatal Care in non-RSDP Areas for births in 12 months preceding the survey, 1998 and 2001



Vaccination coverage declined for several antigens between 1998 and 2001 in RSDP areas (Figure 3.3a). In particular, DPT3 vaccinations fell from 67.6 percent of children 12 to 23 months in 1998 to 55.2 percent of children in 2001. Measles vaccinations fell by 6 percentage points as well, from 68.9 percent to 62.9 percent of children 12 to 23 months. On the other hand, the proportion of children receiving BCG vaccinations did not change, and the proportion with polio vaccinations increased by 6.5 percentage points.

The pattern in non-RSDP areas largely reflects that observed in RSDP areas, indicating perhaps that any negative trends in vaccination coverage do not reflect failure of the project (Figure 3.3b). Specifically, in non-RSDP areas, DPT3 vaccination rates also declined from 68.1 percent of children 12 to 23 months in 1998 to 59.5 percent in 2001. As in RSDP areas, BCG vaccination rates remained approximately the same over the period, and polio3 vaccination rates increased substantially, from 71.7 percent to 85.5 percent. On the other hand, while measles vaccination rates declined in RSDP areas, a small increase of 1 percentage point was observed in non-RSDP areas. This latter result may have contributed to a much smaller overall decline in full vaccination coverage in non-RSDP areas - from 59.4 percent in 1998 to 51.8 percent in 2001 – than was observed in RSDP areas – from 58.9 percent to 45.8 percent.

Figure 3.3a Trends in Vaccination Coverage for Children 12 to 23 months old vaccinated at any time before the survey, 1998 and 2001, RSDP Areas

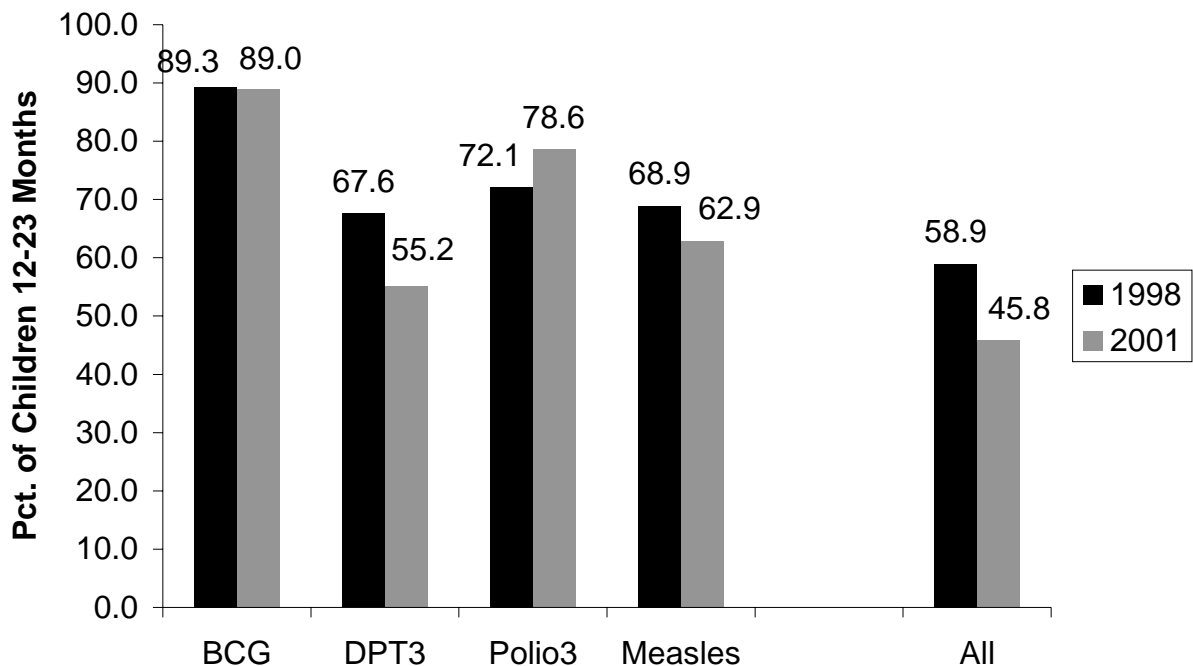
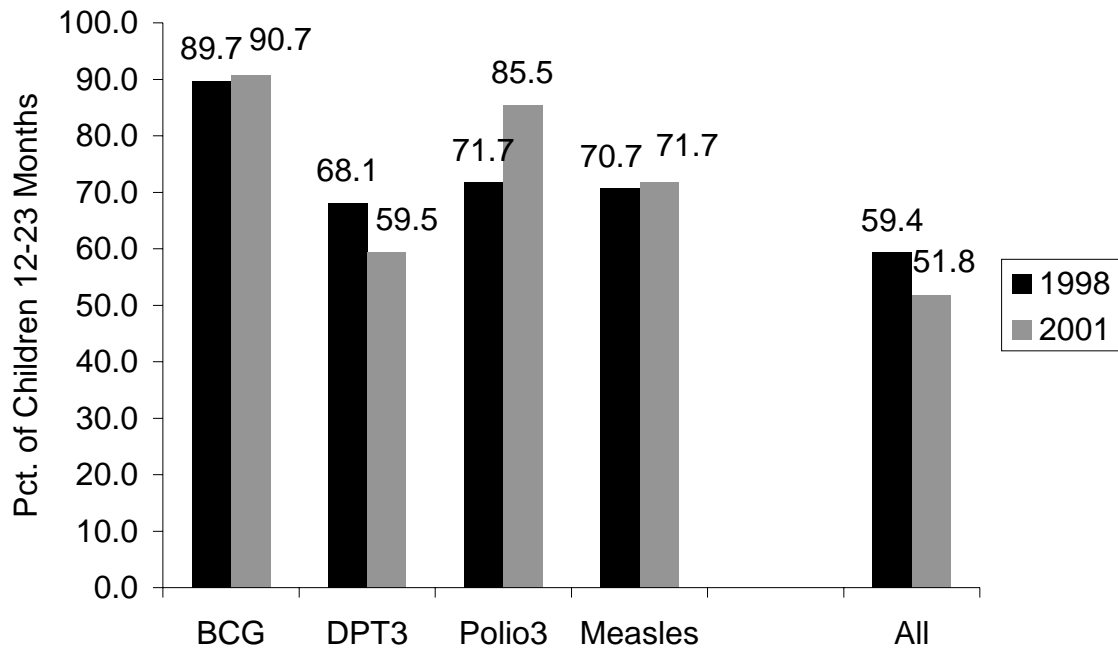
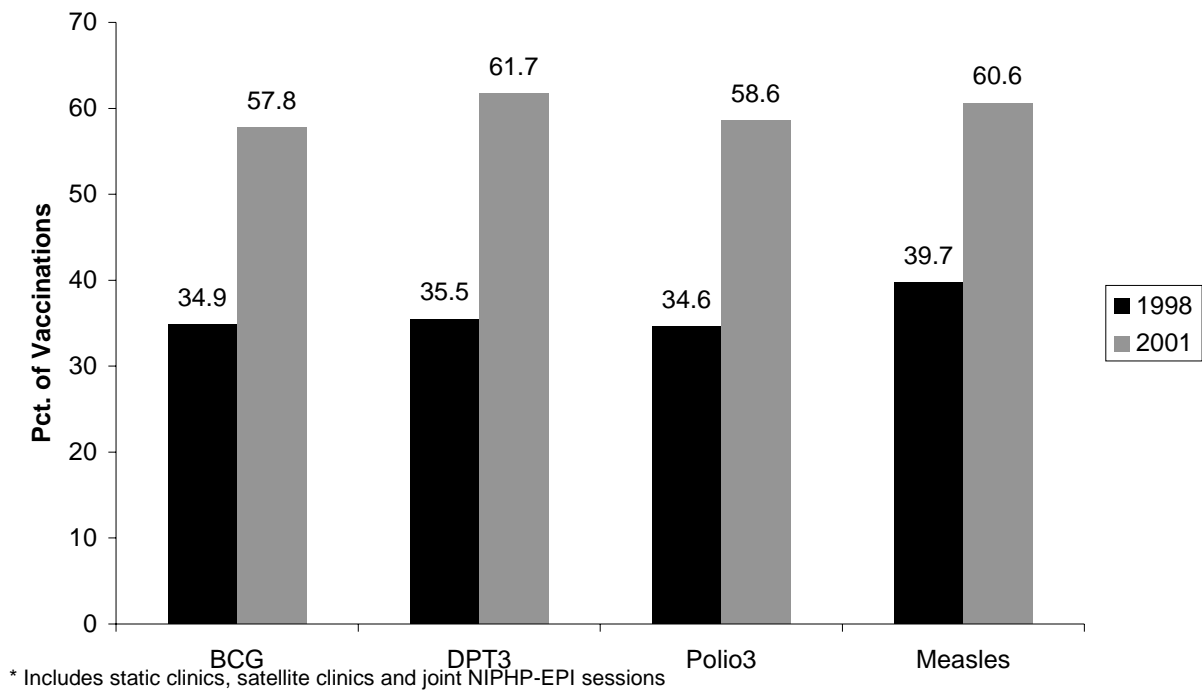


Figure 3.3b Trends in Vaccination Coverage for Children 12 to 23 months old vaccinated at any time before the survey, 1998 and 2001, non-RSDP Areas



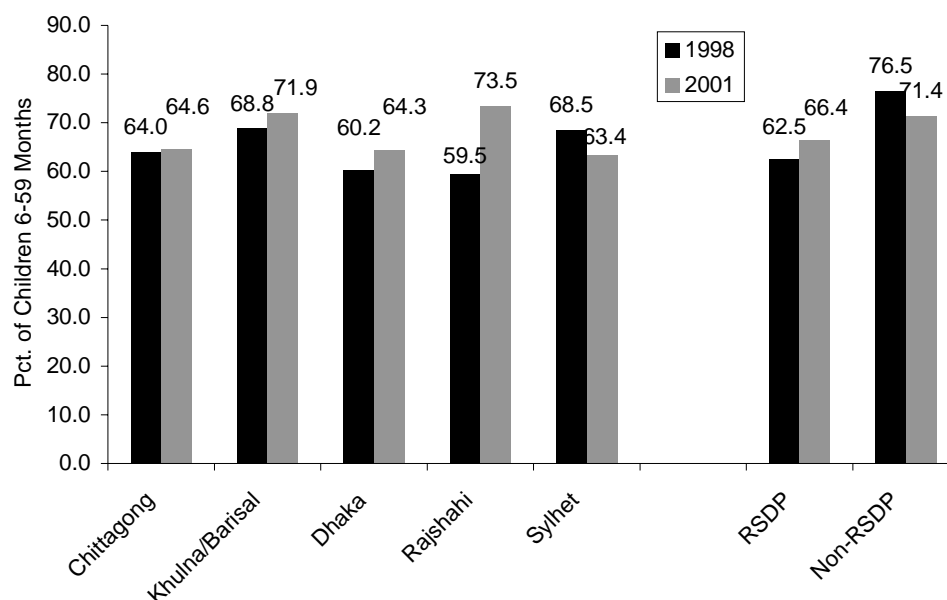
The share of RSDP providers in total vaccination has increased substantially since 1998, almost entirely as a result of the joint NIPHP-EPI sessions (Figure 3.4). In 1998, for example, RSDP providers constituted approximately 35 percent of DPT3 and polio3 vaccinations. In 2001, these shares had increased to approximately 61 percent of all DPT3 and polio3 vaccinations.

Figure 3.4 Share of RSDP Sources* in Total Vaccinations by Antigen, 1998 and 2001



Vitamin A coverage increased from 62.5 percent of children 6 to 59 months of age in the 1998 Baseline Survey to 66.4 percent (Figure 3.5). This increase was not matched in non-RSDP areas, where Vitamin A coverage fell by 5.1 percentage points from 76.5 to 71.4 percent of children aged 6 to 59 months. In 1998, RSDP static and satellite clinics and depotholders provided 34 percent of all Vitamin A in RSDP areas. Unfortunately, no questions regarding the source of Vitamin A were asked in the 2001 Survey.

Figure 3.5 Trends in Vitamin A Coverage among Children 6-59 months, 1998 and 2001

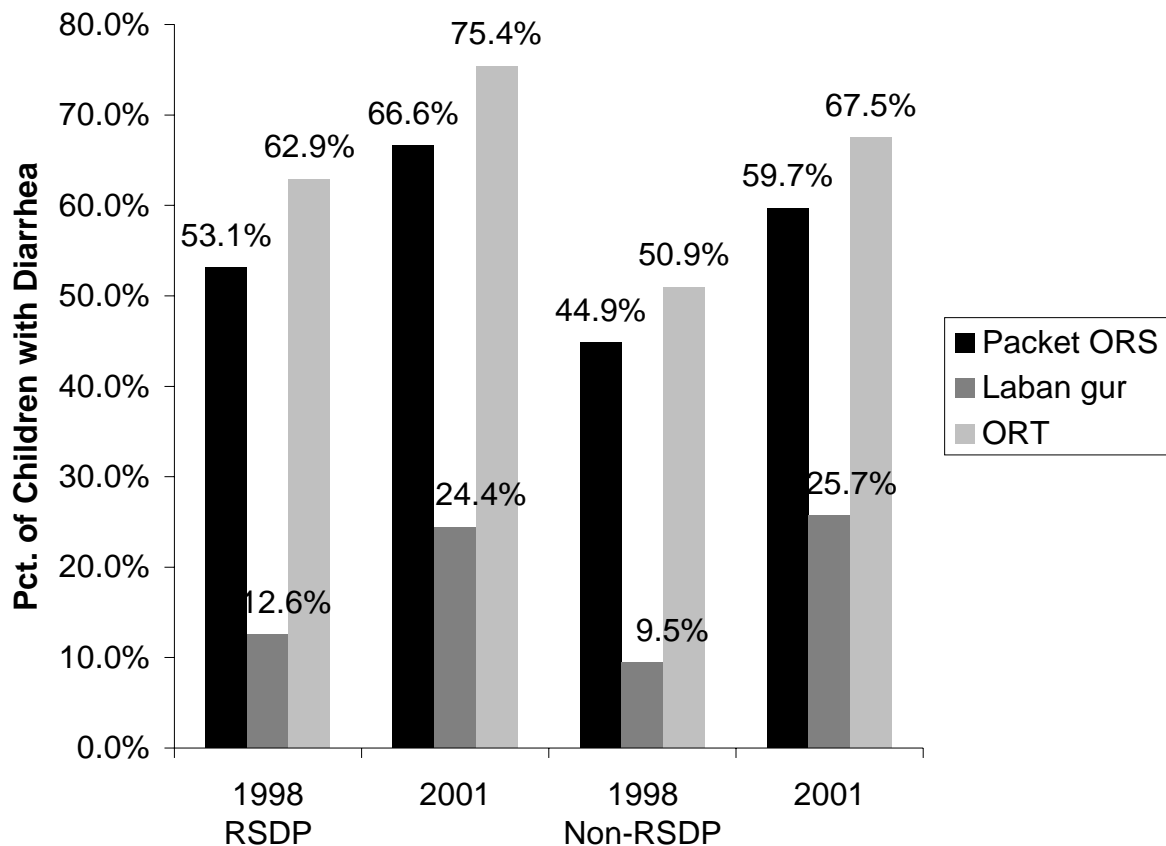


While the presence of the RSDP program appears to have been associated with greater use of other basic health services, it is difficult to discern a significant contribution of RSDP providers in the treatment of basic childhood illnesses. Of the 1,626 ill children¹ who were taken for medical care in RSDP areas, only 18 (1.2 percent) were taken to RSDP providers. Most children received care or services from a pharmacy (36.3 percent), a traditional doctor (29.7 percent) or a private clinic/doctor (12.3 percent). Even public facilities provided less than 11 percent of curative care. In the 1998 Survey, only 1.5 percent of children with ARI symptoms were taken to RSDP providers. In 2001, this share had decreased to 0.4 percent. The public sector provided a larger share – approximately 15 percent of curative care – but other providers still addressed the majority of curative care (83.2 percent).

On the other hand, proper treatment of diarrhea with ORT in RSDP areas increased by 12.5 percentage points from 62.9 percent to 75.4 percent of children with diarrhea (Figure 3.6). An even larger increase in ORT was observed in non-RSDP areas, from 50.9 percent to 67.5 percent of children with diarrhea. Treatment with *laban gur* doubled in RSDP areas and more than doubled in non-RSDP areas. The actual role of RSDP in this improvement is unclear. Of those children with diarrhea who were taken to health care providers in 2001, only 2.7 percent went to RSDP providers, nearly identical to the 3.4 percent who were taken to RSDP providers in 1998.

¹ Cough, rapid breathing, difficulty in breathy, chest in-drawing, or fever.

Figure 3.6 Trends in the Percentage of Children with Diarrhea Receiving Diarrhea Treatment, 1998 and 2001



As noted in the 2001 RSDP Survey Report, awareness of several services at RSDP satellite clinics has improved since the 1998 Baseline Survey. For example, the proportion of women reporting that EPI services are offered at RSDP satellite clinics increased from 54.0 percent to 65.8 percent, while the proportion reporting availability of clinical family planning methods increased from 41.5 percent to 50.2 percent (Figure 3.7). Awareness of other services – antenatal care, ORS and general care for illnesses declined.

Awareness of several services at RSDP static clinics also improved since 1998 (Figure 3.8). In particular, awareness of EPI services has increased from 20.0 percent of women to 47.2 percent of women who knew of RSDP clinics. Smaller increases were observed for clinical family planning methods – from 56.3 percent to 61.8 percent – and antenatal care – from 38.4 percent to 44.4 percent. Declines were noted for non-clinical family planning methods, ORS and treatment of general illnesses.

Figure 3.7 Percentage of women who knew about RSDP satellite clinics and specific services at those clinics

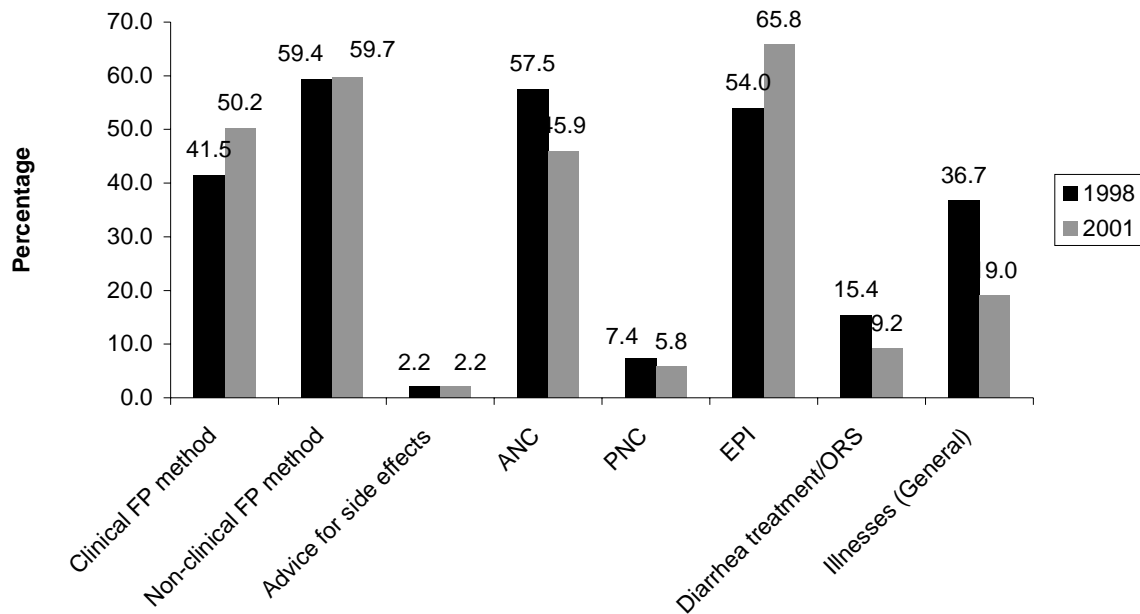
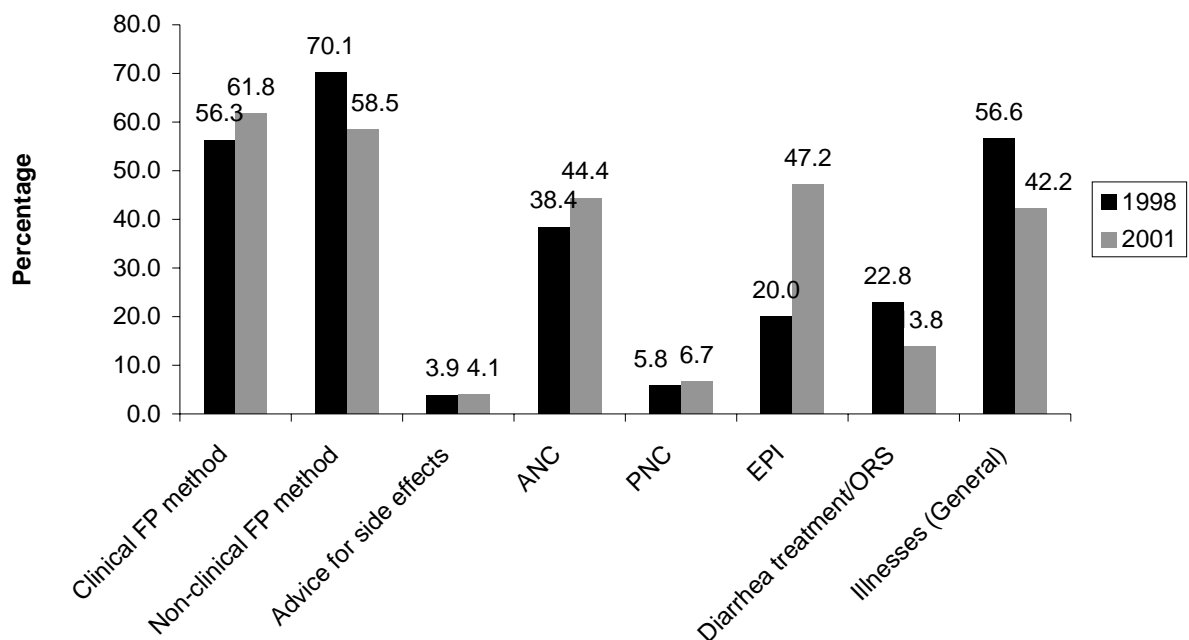


Figure 3.8. Percentage of Women who identify RSDP static clinics and identify specific services at those clinics, 1998 and 2001



4. Impact Evaluation Results

Main Findings:

- Relative to other factors that could have influenced changes in the use of health services from 1998 to 2001, the RSDP program was found to be associated with a 3.3 percentage point increase in modern contraceptive rates, a 8.6 percentage point increase in antenatal care use rates, and an 8.6 percentage point increase in the number of pregnant women receiving at least two tetanus toxoid vaccinations. The impact on awareness of health care providers was also substantial; a 20.4 percentage point increase in awareness of local clinics and a 35.0 percentage point increase in awareness of satellite/mobile clinics.
- Probit estimations examine factors associated with using RSDP providers for basic health services. In general, price does not appear to be a major deterrent to use of RSDP services, while factors such as the RSDP satellite clinic worker's experience and education affect use of RSDP satellite clinics. Few characteristics of static clinics appear to influence their use.

Two types of impact evaluation estimates are undertaken in this section: (a) difference-in-difference pooled analysis of 1998 Baseline Survey and the 2001 RSDP Evaluation Survey and (b) multilevel regression analysis using data from the 2001 Women's Survey linked with the 2001 Facility Survey.

The first set of estimations are the only ones that make use of the 1998 Baseline Survey data. This is because the second set of estimations rely upon community and facility data, neither of which were collected in the 1998 Survey. Of the two methods, the first has the advantage of being able to examine changes since the Baseline Survey, while the second set has the advantage of being able to more fully examine some of the potential impacts of specific characteristics of services on the outcomes of interest.

(a) Difference-in-Difference Pooled Analysis

The first set of estimations, performed on three health behavior variables and two awareness variables, tests whether the presence of the RSDP project was associated with changes over time in key health behaviors that would not have been experienced in the absence of the project. Specifically, Table 4.1 presents probit estimation results for whether or not married women were using modern contraception, whether women with a live birth in the year preceding the survey used antenatal care and had two or more tetanus toxoid vaccinations, and whether women were aware of depotholders and satellite clinics in their villages.

The key variables in the analysis are the year dummy variable (whether the year of observation is 1998 versus 2001), the project area dummy variable and the interaction of the two. In all but one of the estimations, the coefficient on the project area variable is negative and significant, indicating that in 1998, a woman in the project area, controlling

for all of the other independent variables, was less likely to use modern contraception, to receive two or more vaccinations and to be aware of satellite clinics and depotholders. However, for all estimations, the variable that interacts the year 2001 variable with the project area variable (Project*Year) was positive and significant, indicating that by 2001 the negative effects of being in project areas in 1998 had been overturned. Indeed, by 2001 the project had positive and significant effects on modern method use, antenatal care, receiving two or more tetanus toxoid vaccinations and the two knowledge outcomes under study.

The exact impact of the RSDP project is evaluated in Table 4.2, which uses the coefficients from the probit estimations to calculate changes in the dependent variables without the project (“No RSDP”) and with the project (“RSDP”), while controlling for all of the other variables in the model. For example, using women from both project and non-project areas, the absence of the RSDP project would have meant that use of modern contraception would have decreased from 41.0 percent to 39.4 percent of married women. If all married women in both project and non-project areas had been exposed to the RSDP program, modern contraceptive use would have increased slightly from 39.5 percent to 41.2 percent, a 1.7 percentage point increase. The presence of the RSDP program is therefore associated with a net positive impact on contraceptive use of 3.3 percentage points that would not have occurred in the absence of the project.

The presence of the RSDP program also had a substantial impact on ANC use and tetanus toxoid vaccinations. Referring again to Table 4.2, absent the RSDP program, ANC use would have declined from 39.7 percent of women with a live birth to 37.4 percent of such women. With the RSDP program, ANC use would have increased by 6.3 percentage points from 40.3 percent to 46.6 percent of women with a live birth in the last year. The net impact of the program is therefore 8.6 percentage points. The RSDP program was also associated with a net increase of 8.6 percentage points in the proportion of women receiving two or more tetanus toxoid vaccinations and with a net increase of 35.0 percentage points in awareness of satellite clinics.

Table 4.1 Probit Estimations on pooled 1998 and 2001 Data

Independent Variables	Modern Method		ANC		2+ TT		Know Depotholder		Know Satellite	
	Coef	Z	Coef	Z	Coef	Z	Coef	Z	Coef	Z
Age										
20-24	0.350	18.97	-0.027	-0.74	-0.319	-8.77	0.358	20.60	0.241	13.65
25-29	0.530	28.69	0.006	0.15	-0.481	-12.25	0.377	21.45	0.236	13.23
30-34	0.611	32.03	-0.099	-2.04	-0.479	-10.17	0.389	21.34	0.249	13.45
35-39	0.513	25.48	-0.106	-1.61	-0.538	-8.49	0.315	16.50	0.189	9.68
40-44	0.224	10.05	-0.280	-2.48	-0.625	-5.89	0.212	10.43	0.154	7.33
45-49	-0.189	-6.77	-0.398	-1.59	-0.856	-3.63	0.104	4.44	0.077	3.14
Mother's Education										
Primary	0.013	0.97	0.154	4.46	0.074	2.19	0.099	7.52	0.059	4.43
Secondary	0.083	4.63	0.518	11.28	0.345	7.43	0.085	4.77	-0.039	-2.20
University	0.111	2.19	1.334	8.43	0.322	2.53	-0.093	-1.86	-0.178	-3.43
Quintile										
2nd poorest	0.118	7.33	0.145	3.52	0.041	1.03	0.033	2.13	-0.033	-2.10
Middle	0.121	7.16	0.239	5.41	0.140	3.25	0.025	1.51	-0.009	-0.52
2 nd richest	0.144	8.64	0.363	8.24	0.153	3.51	0.031	1.93	0.016	1.01
Richest	0.150	7.82	0.585	11.29	0.310	5.99	-0.069	-3.80	-0.039	-2.04
Division										
Chittagong	-0.247	-15.14	-0.066	-1.62	-0.107	-2.71	-0.224	-14.84	-0.093	-5.98
Khulna/Barisal	0.247	14.79	0.231	4.93	-0.101	-2.20	0.252	14.60	0.249	14.53
Rajshahi	0.275	17.70	0.220	5.10	0.121	2.85	0.370	22.67	0.189	11.96
Sylhet	-0.519	-27.30	0.327	7.37	0.006	0.15	-0.366	-22.39	0.024	1.34
Year	-0.044	-1.51	-0.063	-1.47	-0.020	-0.23	-0.649	-23.43	-0.538	-15.55
Project Area	-0.041	-2.48	0.017	0.19	-0.094	-2.23	-0.057	-3.53	-0.293	-11.18
Project* Year	0.090	2.76	0.237	2.37	0.228	2.32	0.569	18.08	1.028	27.01
Intercept	-0.677	-30.09	-0.682	-12.9	0.246	4.81	0.362	17.27	0.453	14.98
Obs	58400		8650		8650		68104		62262	
Chi2 (20)	4273.2		860.66		584.23		3720.5		2221.8	
Pseudo R2	0.054		0.0745		0.0488		0.0458		0.0283	

Table 4.2 Simulated Impacts of RSDP Program

	No RSDP RSDP		No RSDP RSDP		No RSDP RSDP		No RSDP RSDP		No RSDP RSDP	
1998	41.0%	39.5%	39.7%	40.3%	54.2%	50.6%	74.5%	72.7%	75.0%	65.0%
2001	39.4%	41.2%	37.4%	46.6%	53.4%	58.4%	51.5%	70.1%	55.7%	80.7%
Absolute Change	-1.6%	1.7%	-2.2%	6.3%	-0.8%	7.8%	-23.0%	-2.6%	-19.3%	15.8%
Net Change	3.3%		8.6%		8.6%		20.4%		35.0%	

(b) Multilevel Analysis of 2001 RSDP Evaluation Survey with Facility Characteristics

The multilevel analyses link women and children to their service supply environment in order to determine the relative importance of individual and supply characteristics on the use of essential services. Two main sets of services are examined here: women's reproductive health services including use of modern contraception (and of specific types of RSDP contraception providers) and use of antenatal care (and of specific types of RSDP antenatal care providers) and children's health services and health outcomes including immunizations and illness prevalence. The effects of the project are measured by two main sets of variables – categorical variables for proximity to RSDP static and satellite clinics and a dummy variable for being in a project area or not. Categorical variables for proximity are used in this section to attempt to elicit additional information on specifically how important accessibility is in affecting use of health services.

Use of Modern Contraception

The first estimation (Table 4.2) examines factors associated with whether or not a married woman uses modern contraception. Several results are worth noting. First, using a definition of socioeconomic status defined relative only to rural Bangladesh populations, being in any quintile other than the poorest is significantly associated with higher contraceptive use. Even so, the magnitudes of the effects, calculated using the estimated coefficients, are not large (Figure 4.1). In RSDP areas, being in the poorest quintile, controlling for proximity to clinics and individual-level factors, is associated with a decreased likelihood of using modern contraception of 4.1 percentage points relative to the richest quintile; 38.2 percent of women in the poorest quintile would be expected to use modern contraception as compared with 42.3 percent of women in the richest quintile. This gap is nearly identical in non-RSDP areas.

Second, relative to women in Dhaka division, women in Khulna/Barisal and Rajshahi are more likely to use modern contraception, while women in Chittagong and Sylhet are less likely to use modern contraception. Third, women aged 20 to 44 years are more likely to use modern contraception than women aged 12 to 19 years.

The effects of the RSDP program are measured through service availability as proxied by the distance variables from sample clusters to clinics. Closer RSDP facilities would be expected to be used more frequently by women. However, proximity does not appear to be a significant determinant of use of RSDP clinics or depotholders. While the coefficients on the distance variables are all of the expected sign, they are not significantly associated with use of modern contraception. Only for NGO/Private Clinics does greater distance from a household negatively affect use of modern contraception. A separate variable indicating residence in an RSDP area (as opposed to a non-RSDP area), was also tried in several models but was not found to be statistically significant.

While proximity may have only small impacts on the choice of whether to use modern contraception – women who are motivated to use contraception may, to a certain extent, use it regardless of how far they must travel – proximity may in fact be a very significant

determinant of which contraceptive provider a woman chooses. This is evident in the latter three estimations in Table 4.3, which look at factors associated with use of specific RSDP providers involving the sample of women in RSDP areas. For use of both RSDP static and RSDP satellite clinics, closer facilities are statistically more likely to be used by contraceptive users.

The estimations of factors associated with use of specific RSDP facilities contain many interesting results, but only the results focusing on the effects of socioeconomic status and specific facility characteristics will be discussed here. Overall, higher socioeconomic status does not appear to be associated with greater use of RSDP static clinics, indicating relatively even use by all socioeconomic groups. For RSDP satellite clinics however, higher socioeconomic status is associated with a lower likelihood of use for modern contraception. This pattern is consistent with the simple bivariate tabulations.

Except for distance, facility characteristics do not play an important role in determining whether women use RSDP static clinics. While the variables for the number of days open per week and the range of services offered are all of the expected sign (higher values are associated with greater probabilities of use), the results are not statistically significant. The effect of price on use of RSDP static clinics is significant at the 11 percent level; a 3 taka increase in the price of pills – from a mean of 5 taka – would decrease use by 2.6 percentage points from the observed value of 4.3 percent to 2.7 percent of contraceptive users.

Several characteristics of the satellite clinic and the satellite clinic worker were examined – worker experience, marital status, whether or not the clinic was an upgraded clinic, number of sessions per month and the price of injections - to determine their impact on use. Again, no significant impacts were apparent. In fact, satellite clinics were more likely to be used if they charged a higher price for injectable contraceptives, a finding that may reflect the inadequacy of quality measures. Distance was a highly significant determinant of use of RSDP satellite clinics. Overall, 22 percent of women use RSDP satellite clinics for modern contraception, and most women live within 1 kilometer of an RSDP satellite clinic. However, being beyond that distance significantly reduces the likelihood of use. If all women lived within 1 kilometer of a satellite clinic, the RSDP satellite clinic share would increase to 23.7 percent, but being beyond 1 kilometer would decrease the RSDP share to 12.9 percent.

Use of depotholders for modern contraception also appears to be generally independent of the depotholder's characteristics. Neither distance, experience, the price of pills, nor the number of supervision visits affect use of the depotholder. However, higher prices for condoms significantly reduce the likelihood that a depotholder will be used. Increasing the price of method supplies (proxied here by the price of condoms) by 3 taka (from a mean of 3 Taka) would decrease use by 3.8 percentage points from 17.6 percent to 13.8 percent. Not charging for condoms would conversely increase use by 4 percentage points to 21.7 percent (from the observed value of 17 percent of women).

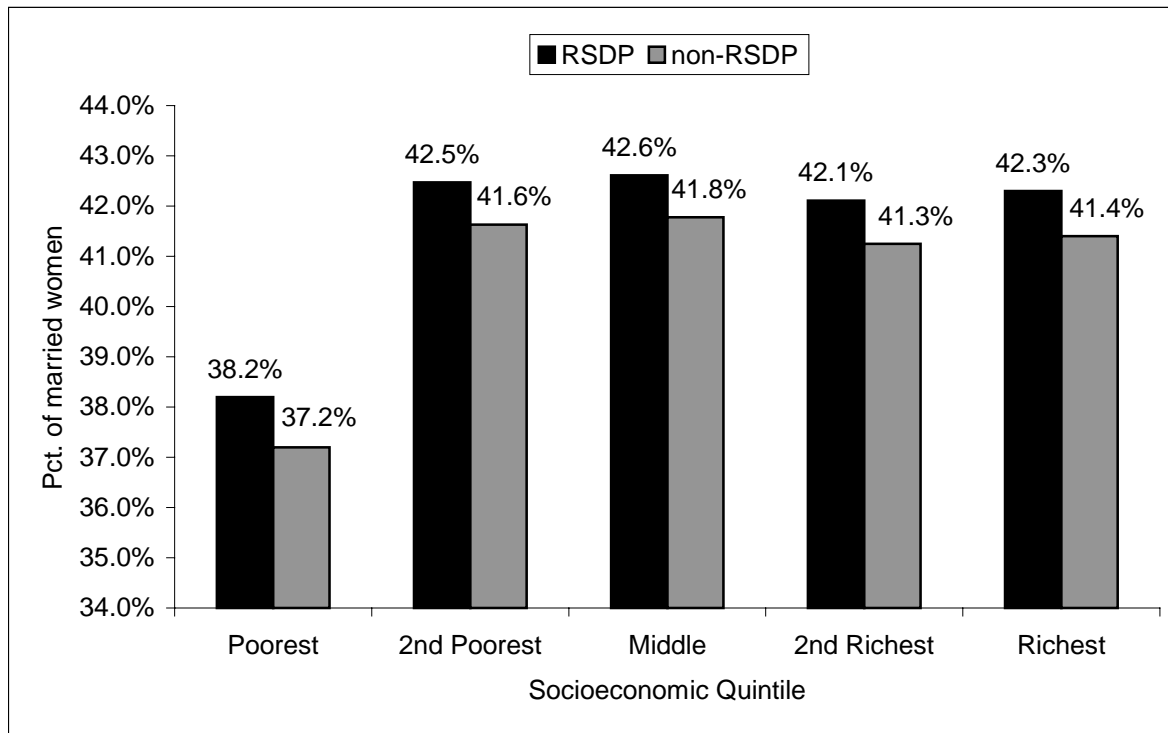
Depotholders with higher levels of education, however, are more likely to be visited. For example, the likelihood that a women will choose to get her contraceptive method from a depotholder increases by approximately 4 percentage points, from 15.3 percent of users to 19.4 percent of users, if the depotholder has a secondary education relative to having only a primary level education.

Table 4.3 Probit Estimations of Use of Modern Contraception and Use of RSDP Providers

Independent Variables	Modern Method		Static Clinic		Satellite Clinic		Depotholder	
	Coef.	Z	Coef.	Z	Coef.	Z	Coef.	Z
Children Ever Born	0.040	4.68	0.109	3.69	0.101	6.11	0.032	1.86
Age								
20-24	0.332	7.29	-0.211	-1.34	0.073	0.77	0.017	0.18
25-29	0.501	10.43	-0.274	-1.74	-0.022	-0.22	-0.087	-0.90
30-34	0.565	10.26	-0.521	-2.99	-0.194	-1.78	-0.160	-1.52
35-39	0.469	7.80	-0.535	-3.19	-0.429	-3.50	-0.317	-2.77
40-44	0.204	2.82	-0.795	-3.33	-0.538	-3.98	-0.609	-4.55
45-49	-0.105	-1.26	-1.372	-3.45	-0.956	-5.29	-0.366	-2.20
Education (omitted='none')								
Primary	-0.054	-1.66	-0.139	-1.01	0.005	0.08	0.036	0.55
Secondary	0.061	1.61	-0.092	-0.65	-0.112	-1.29	-0.030	-0.34
University	0.148	1.67	-0.670	-1.17	-0.398	-1.77	-0.135	-0.64
Quintile (omitted='poorest')								
2nd poorest	0.120	3.17	0.207	1.52	-0.050	-0.72	0.124	1.60
Middle	0.124	3.13	0.066	0.44	-0.161	-2.03	0.152	1.78
2nd richest	0.110	2.50	0.326	1.91	-0.240	-2.83	0.169	1.86
Richest	0.115	2.32	0.148	0.73	-0.394	-3.77	0.089	0.81
Division (omitted='Dhaka')								
Chittagong	-0.272	-4.38	-0.115	-0.42	0.069	0.57	-0.013	-0.11
Khulna/Barisal	0.398	6.52	0.084	0.37	0.014	0.10	0.005	0.05
Rajshahi	0.446	9.02	0.386	2.08	0.085	0.84	0.225	2.23
Sylhet	-0.615	-9.58	0.159	0.69	0.210	1.36	-0.045	-0.32
Static Clinic								
Days Open Per week			0.061	0.74				
Medical Assts.			-0.016	-0.14				
Services offered			0.046	1.50				
Price Pills			-0.097	-1.53				
Satellite Clinic								
Experience (years)					0.046	1.49		
Married					-0.056	-0.55		
Upgraded clinic					-0.186	-1.46		
Sessions per month					0.021	0.35		
Price injections					0.115	2.76		
Depotholder								
Experience (years)							0.007	0.57
Education							0.162	2.11
Price condoms							-0.054	-1.84
Price pills							0.026	0.88
Supervision visits							0.005	1.25
Distance								
Hospital 0-5 km	0.094	0.73						
Hospital 5-10 km	-0.072	-0.81						
THC 0-1 km	0.241	2.48						

Independent Variables	Modern Method		Static Clinic		Satellite Clinic		Depotholder	
	Coef.	Z	Coef.	Z	Coef.	Z	Coef.	Z
THC 2-5 km	0.023	0.33						
THC 5-10 km	0.074	1.26						
FWC 0-1 km	0.254	1.88						
FWC 2-5 km	0.174	1.30						
FWC 5-10 km	0.158	1.07						
RSDP Stat 0-1 km	0.087	1.17	1.987	11.76				
RSDP Stat 2-5 km	-0.005	-0.10	0.746	4.59				
RSDP Stat 5-10 km	0.053	0.49						
NGO Clinic 0-1 km	-0.062	-0.35						
NGO Clinic 2-5 km	-0.029	-0.52						
NGO Clinc 5-10 km	-0.147	-2.76						
DH 0-1 km	-0.046	-0.25					0.041	0.30
DH 2-5 km	-0.176	-1.01						
DH 5-10 km	-0.150	-0.72						
RSDP Sat 0-1 km	0.090	0.66			0.433	2.26		
RSDP Sat 2-5 km	0.172	1.34						
RSDP Sat 5-10 km	0.136	0.94						
NGO Sat 0-1 km	0.053	0.80						
NGO Sat 2-5 km	0.034	0.57						
NGO Sat 5-10 km	0.024	0.37						
Intercept	-1.044	-5.97	-3.754	-5.51	-1.750	-5.33	-1.351	-5.37
Obs	11906		3742		3742		3742	
Wald chi2 (41)	824.12		211.52		159.79		65.47	
Pseudo R2	0.0691		0.272		0.0515		0.026	
Test asset quintiles			6.17					
chi2(4)	12.81		0.19		19.36		4.46	
Prob >chi2	0.01		-3.754	-5.51	0.00		0.34	

Figure 4.1 Simulated Effects of Socioeconomic Quintile on Use of Modern Contraception

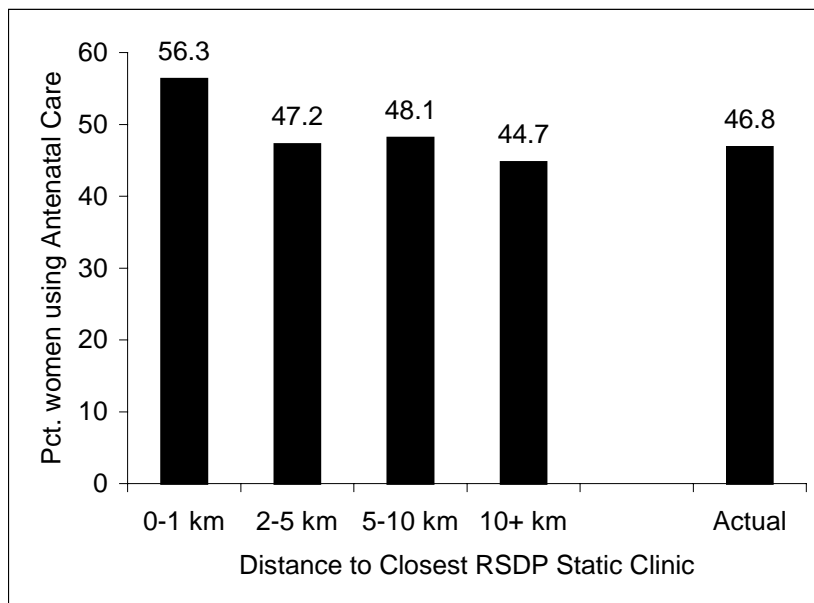


Antenatal Care

As shown in the earlier difference-in-difference models, the RSDP program has had a substantial impact upon antenatal care use in project areas – responsible for approximately a 9 percentage point increase in antenatal care use from 1998 to 2001. This section explores what factors may have influenced antenatal care use and use of specific types of RSDP facilities. Table 4.4 presents probit estimation results for three dependent variables: (1) overall antenatal care use, (2) use of RSDP satellite clinics for antenatal care, and (3) use of RSDP static clinics for antenatal care.

The first estimation, use of any antenatal care among women having a live birth in the past year, indicates that individual characteristics dominate decisions to use antenatal care, though proximity to RSDP providers also affects overall antenatal care rates. In fact, only for RSDP static clinics is there a statistically significant effect of proximity on antenatal care rates. For women in RSDP areas, living within 1 kilometer of an RSDP static clinic increases the likelihood that a woman will use antenatal care by 9.1 percentage points relative to living 2 to 5 kilometers from the RSDP static clinic and by 11.6 percentage points relative to living 10 or more kilometers from the RSDP static clinic (Figure 4.2).

Figure 4.2 Effect of Distance to RSDP Static Clinic on Overall Antenatal Care Use



Socioeconomic status is clearly associated with greater likelihood of using any antenatal care. Specifically, after controlling for proximity, education and other characteristics, women in the lowest socioeconomic quintile in RSDP areas are 22.5 percentage points less likely to use antenatal care than women in the highest socioeconomic quintile (39.5 percent versus 62.0 percent) (Figure 4.3). In non-RSDP areas, the gap is similar, approximately 21.5 percentage points (29.8 percent versus 51.7 percent). In comparison, the gaps between the poorest and richest quintiles without controls for other factors are many times larger - 35 percentage points in RSDP areas and 45 percentage points in non-RSDP areas – indicating that differences between the rich and poor in levels of antenatal care use are not completely attributable solely to socioeconomic status (ACPR and MEASURE *Evaluation*, 2001 RSDP Evaluation Survey Report).

On the other hand, there appears to be relative parity across socioeconomic quintiles in the use of RSDP providers for antenatal care. In general, there is not a statistically significant relationship between socioeconomic status and whether or not a woman chooses to use of antenatal care at RSDP clinics. For RSDP satellite clinics, only the richest quintile of women use RSDP satellite clinics for antenatal care at a significantly lower rate than women in the poorest quintile. Women in richer quintiles are less likely to use RSDP static clinics, but not at a statistically significant level.

Factors such as education and division of residence play large roles in the use of antenatal care when controlling for all other factors. These impacts are shown in Figure 4.4. For example, controlling for income and location of residence, only 42 percent of women with no formal education seek antenatal care, as compared with 50 percent of women with primary education and 59 percent of women with secondary education. A positive, but substantially smaller, effect of husband's education on antenatal care use is also predicted.

Table 4.4 also depicts the effects of division of residence – proxies for other characteristics of the service supply environment not measured by the survey variables – on use of antenatal care. Relative to residents of Dhaka, women in all other divisions are more likely to use antenatal care, particularly women in Khulna/Barisal and Rajshahi. The magnitudes of these effects are shown in Figure 4.4, where women in Khulna/Barisal and Rajshahi are shown to be 15.2 and 12.4 percentage points more likely to use antenatal care than women in Dhaka division. Women in Sylhet are more likely to use RSDP satellite clinics and less likely to use RSDP static clinics than women in Dhaka division.

Only a few characteristics of RSDP clinics have measurable effects on the probability of their use. An extra year of experience by a satellite clinic worker is associated with a 4 percentage point increase in antenatal care use (simulation not shown). Greater availability of services at RSDP static clinics has a moderate effect on overall use; if an RSDP static clinic were to offer an additional 3 services – from a mean of 18 services – the use of antenatal care at RSDP static clinics would increase by 2.5 percentage points.

Table 4.4 Probit Estimations of Use of Antenatal Care and Use of RSDP Providers for Antenatal Care (Women with live birth in last year)

Independent Variables	ANC		RSDP Static Clinic		RSDP Satellite clinic	
	Coef.	Z	Coef.	Z	Coef.	Z
Age						
20-24	0.070	0.83	-0.048	-0.21	0.019	0.16
25-29	0.030	0.31	0.257	1.23	0.073	0.41
30-34	-0.104	-0.98	-0.241	-0.82	0.008	0.04
35-39	0.035	0.23	0.284	0.85	0.124	0.45
40-49	-0.063	-0.29	0.864	1.65	0.519	1.27
Mother's Education						
Primary	0.314	3.84	-0.020	-0.10	-0.239	-1.80
Secondary or above	0.496	4.36	0.006	0.02	-0.501	-2.70
Husband's Education						
Primary	0.097	1.15	0.224	0.84	0.131	0.83
Secondary or above	0.248	2.47	0.271	0.93	-0.268	-1.54
Quintile (omitted='poorest')						
2nd poorest	0.173	1.86	0.261	1.05	-0.094	-0.53
Middle	0.188	1.80	-0.294	-0.93	-0.119	-0.61
2nd richest	0.360	3.20	-0.456	-1.37	-0.072	-0.33
Richest	0.614	4.83	-0.663	-1.59	-0.718	-3.00
Division (omitted='Dhaka')						
Chittagong	-0.078	-0.55	-0.102	-0.22	-0.233	-0.96
Khulna/Barisal	0.375	2.50	0.319	0.95	-0.308	-1.43
Rajshahi	0.451	3.21	-0.123	-0.40	0.089	0.44
Sylhet	0.362	2.63	-0.633	-1.90	0.434	2.09
Distance						
Hospital 0-5 km	0.589	1.71				
Hospital 5-10 km	0.143	1.03				
THC 0-1 km	-0.180	-0.66				
THC 2-5 km	0.096	0.61				
THC 5-10 km	0.137	0.99				
FWC 0-1 km	0.334	1.03				
FWC 2-5 km	0.406	1.27				
FWC 5-10 km	0.413	1.16				
RSDP Stat 0-1 km	0.444	2.79	2.591	8.76		
RSDP Stat 2-5 km	0.129	1.23	0.567	2.10		
RSDP Stat 5-10 km	0.118	0.62	-0.108	-0.24		
NGO Clinic 0-1 km	0.412	0.68				
NGO Clinic 2-5 km	-0.001	-0.01				
NGO Clinic 5-10 km	-0.108	-0.84				
DH 0-1 km	-0.049	-0.15				
DH 2-5 km	-0.078	-0.25				
DH 5-10 km	-0.138	-0.39				
RSDP Sat 0-1 km	-0.087	-0.44			1.200	1.91
RSDP Sat 2-5 km	-0.184	-0.88			-0.186	-0.24
RSDP Sat 5-10 km	-0.240	-1.03			0.081	0.11
NGO Sat 0-1 km	0.063	0.45				

Independent Variables	ANC		RSDP Static Clinic		RSDP Satellite clinic	
	Coef.	Z	Coef.	Z	Coef.	Z
NGO Sat 2-5 km	0.087	0.67				
NGO Sat 5-10 km	0.105	0.79				
Project Area	-0.024	-0.12				
Static Clinic						
Total Staff			0.037	1.36		
Services			0.105	1.90		
Price of ANC			0.065	3.27		
Satellite Clinic						
Years present					0.135	2.65
Worker Training					-0.191	-1.09
Upgraded					0.222	0.83
Supervision visits					-0.003	-0.60
ANC price					-0.056	-0.50
Intercept	-1.204	-3.12	-4.828	-3.78	-0.637	-0.86
Obs	1733		620		620	
Wald chi2 (41)	231.07		137.34		118.29	
Pseudo R2	0.101		0.426		0.183	
Chi2 Tests						
Assets	71.7	0.00	10.46	0.03	14.59	0.01
Facility Characteristics			18.42	0.00	10.41	0.06

Figure 4.3 Simulated Effects of Socioeconomic Status on Use of Any Antenatal Care Provider, RSDP and non-RSDP areas (Women with live birth in last year)

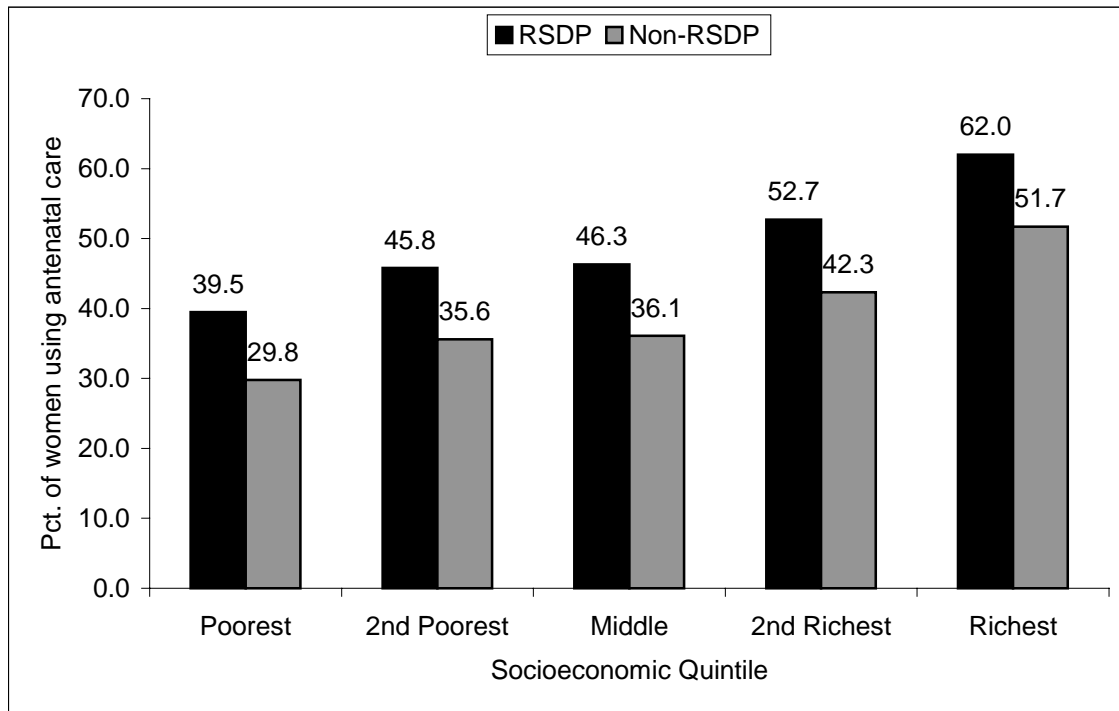
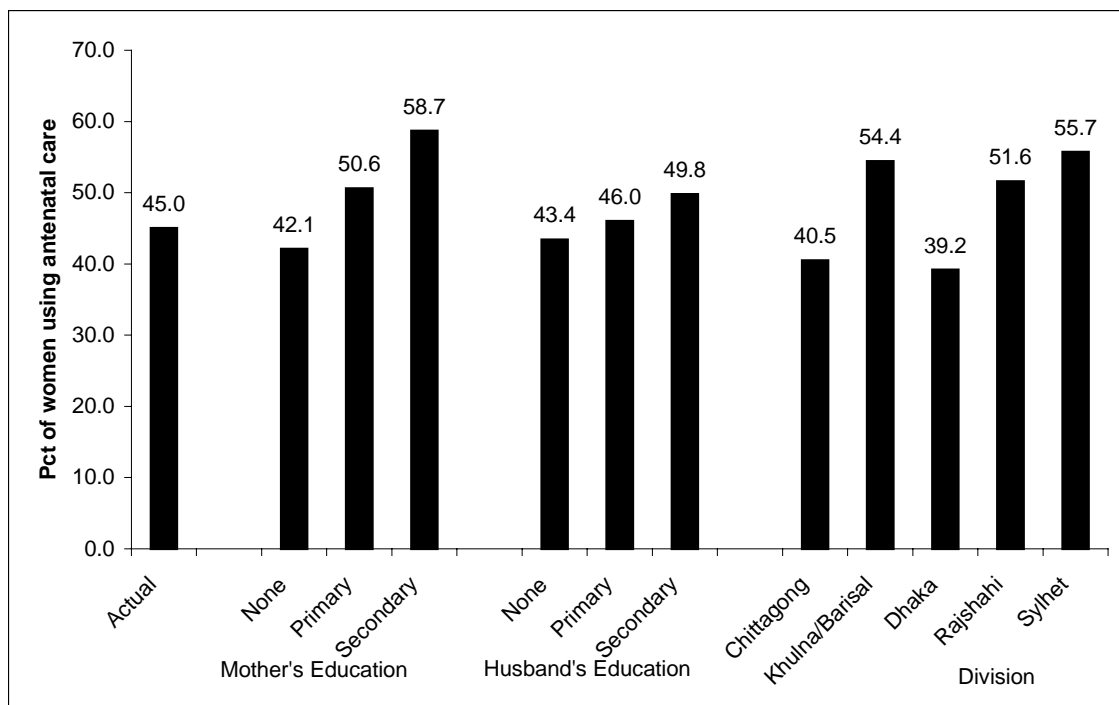


Figure 4.4 Simulated Effects on Antenatal Care Use (Women with live birth in last year)



Child Health

Probit estimations are used to examine factors associated with whether or not children aged 12 to 35 months received specific childhood vaccinations. These estimations find very little project impact on childhood vaccinations. None of the RSDP proximity variables are statistically significant predictors of childhood immunizations nor in any case is the project dummy variable positively associated with vaccination status at a statistically significant level. On the other hand, being within 5 kilometers of a hospital and being within 1 kilometer of an NGO clinic are positively associated with DPT3 and measles vaccinations.

At the individual level, several factors are associated with an increased likelihood of a child being vaccinated. For the most part, children of mothers with primary or secondary education are more likely to receive all antigens, as are, to a lesser extent, children of more educated fathers. Socioeconomic status is positively associated with vaccination status.

Table 4.5 Probit Estimations of Childhood Vaccinations, Aged 12-35 Months, RSDP and non-RSDP Areas

Independent Variables	DPT3		Measles		Polio3		BCG	
	Coef	Z	Coef	Z	Coef	Z	Coef	Z
Age 24-35 months	0.005	0.12	0.231	4.78	0.112	2.43	0.021	0.32
Female	-0.186	-3.87	-0.211	-4.33	-0.132	-2.83	-0.192	-2.90
Mother's Age								
20-24	0.015	0.22	0.021	0.30	0.005	0.07	-0.227	-2.24
25-29	-0.009	-0.13	0.013	0.17	0.017	0.24	-0.182	-1.86
30-34	-0.159	-1.93	-0.082	-0.97	-0.150	-1.87	-0.411	-3.73
35-39	-0.213	-2.15	-0.030	-0.30	-0.187	-1.96	-0.429	-3.30
40-49	-0.206	-1.54	-0.110	-0.80	-0.068	-0.51	-0.561	-3.35
Mother's Educ								
Primary	0.028	0.46	0.112	1.76	0.128	2.00	0.148	1.88
Secondary or Above	0.194	2.41	0.341	3.86	0.306	3.44	0.347	2.68
Father's Educ								
Primary	0.070	1.06	0.141	2.07	0.064	0.98	0.140	1.45
Secondary or Above	0.096	1.38	0.092	1.22	0.086	1.22	0.035	0.33
Asset Quintile								
2	0.179	2.79	0.214	3.21	0.145	2.43	0.032	0.41
3	0.211	2.88	0.285	3.59	0.196	2.71	0.170	1.79
4	0.232	3.03	0.291	3.39	0.242	3.24	0.361	3.39
Fichest	0.574	5.94	0.584	5.30	0.579	5.99	0.632	3.89
Division								
Chittagong	0.103	0.83	0.024	0.19	0.014	0.12	-0.198	-1.48
Khulna/Barisal	0.379	2.93	0.403	3.07	0.191	1.65	0.248	1.66
Rajshahi	0.631	5.16	0.523	4.79	0.325	3.11	0.551	3.90
Sylhet	0.101	0.90	-0.044	-0.42	-0.064	-0.69	-0.193	-1.54
Distance								
Hospital 0-5 km	0.589	2.50	0.683	2.19	0.110	0.58	0.164	0.45
Hospital 5-10 km	-0.131	-0.83	0.057	0.36	-0.082	-0.60	0.074	0.39

Independent Variables	DPT3		Measles		Polio3		BCG	
	Coef	Z	Coef	Z	Coef	Z	Coef	Z
THC 0-1 km	0.004	0.02	0.311	1.28	-0.037	-0.23	0.061	0.25
THC 2-5 km	0.023	0.19	0.184	1.54	0.035	0.36	0.098	0.76
THC 5-10 km	0.114	1.03	0.191	1.86	0.126	1.40	0.121	1.12
FWC 0-1 km	0.177	0.87	0.020	0.10	0.046	0.23	-0.188	-0.66
FWC 2-5 km	0.151	0.78	-0.063	-0.33	-0.121	-0.62	-0.250	-0.92
FWC 5-10 km	0.080	0.35	-0.115	-0.52	-0.083	-0.38	-0.355	-1.18
RSDP Stat 0-1 km	0.060	0.42	-0.044	-0.29	0.048	0.40	-0.111	-0.61
RSDP Stat 2-5 km	0.013	0.16	-0.058	-0.70	-0.016	-0.22	-0.102	-1.00
RSDP Stat 5-10 km	0.206	0.94	0.059	0.30	0.186	1.01	0.173	0.78
NGO Clinic 0-1 km	0.734	3.31	0.677	2.74	0.378	1.92	0.143	0.56
NGO Clinic 2-5 km	-0.028	-0.26	-0.186	-1.93	-0.077	-0.94	-0.237	-1.89
NGO Clinc 5-10 km	0.077	0.82	-0.081	-0.83	0.054	0.66	-0.085	-0.75
DH 0-1 km	-0.218	-0.70	0.063	0.21	-0.047	-0.22	-0.112	-0.36
DH 2-5 km	-0.288	-1.00	0.177	0.62	-0.002	-0.01	0.135	0.45
DH 5-10 km	-0.059	-0.18	0.064	0.19	0.183	0.71	0.165	0.43
RSDP Sat 0-1 km	0.232	0.90	0.080	0.30	-0.025	-0.14	0.226	0.95
RSDP Sat 2-5 km	0.217	0.87	0.075	0.30	-0.026	-0.15	0.135	0.58
RSDP Sat 5-10 km	0.105	0.41	0.184	0.66	-0.077	-0.38	0.112	0.40
NGO Sat 0-1 km	0.318	2.86	0.299	2.66	0.320	3.34	0.560	3.90
NGO Sat 2-5 km	0.106	0.93	0.279	2.41	0.209	2.11	0.426	3.10
NGO Sat 5-10 km	0.091	0.89	0.055	0.57	0.038	0.42	0.074	0.56
Project Area	-0.192	-1.15	-0.036	-0.25	0.055	0.40	0.202	1.21
Intercept	-0.299	-1.23	-0.251	-1.28	0.112	0.56	1.092	3.49
Obs	3193		3193		3493		3193	
Wald chi2(43)	217.4		233.8		180.7		154.1	
Chi2 Tests								
Income	36.11	0.0	31.65	0.0	7.84	0.10	22.65	0.00
Stat Clinic Distance	1.02	0.79	0.75	0.86	10.05	0.02	2.25	0.52
Satellite Clinic Distance	1.49	0.68	0.70	0.87	3.77	0.28	0.99	0.80

In order to examine what factors affected whether children received vaccinations from RSDP providers, probit estimations were undertaken in which the dependent variable was whether or not a child received a vaccine from an RSDP static clinic, an RSDP satellite clinic, or a joint RSDP/GOB vaccination session.

As shown in Table 4.6, children in higher socioeconomic groups are less likely to use RSDP facilities. Further, there does not appear to be a significant relationship between education and use of RSDP facilities. Older children are less likely to receive vaccinations from RSDP clinics relative to children aged 12 to 23 months, a modest indication of increasing use of RSDP clinics. Girls are more likely to receive childhood vaccinations from RSDP facilities than boys. Relative to children living in Dhaka division, children in Khulna/Barisal and Rajshahi divisions are more likely to use RSDP facilities.

The use of RSDP health care providers appears to be influenced by several characteristics of the providers. Whether or not an RSDP static clinic has a doctor is positively associated with the likelihood that children will receive polio vaccinations, increasing the likelihood of use by 7.5 percentage points. Higher prices are positively associated with the likelihood that RSDP static clinics will be used, perhaps an indication that individuals prefer higher-quality services. An index of IEC components² is also positively associated with use. A one standard deviation increase in the availability of IEC materials increases the likelihood of use of RSDP static clinics for measles vaccinations by 4.4 percentage points and for polio vaccinations by 2.9 percentage points. Use of RSDP satellite clinics is positively associated with the length of time that the clinic has been operating in the community; each additional year that a clinic has been open increases the likelihood of use by 4 percentage points. A dummy variable for whether a satellite clinic worker is married increases the use of satellite clinics for polio vaccinations by 8 percentage points. The proximity variables are generally not significant, except for being within 1 kilometer of an RSDP static clinics, which paradoxically is negatively associated with use.

² Posters or pamphlets on family planning, antenatal care, safe delivery, danger signs of pregnancy, child immunizations, diarrhea and ARI treatment, HIV/AIDS, and nutrition.

Table 4.6 Probit Estimations of Use of RSDP Facilities for Immunizations

Independent Variables	DPT3		Measles		Polio		BCG	
	Coef	Z	Coef	Z	Coef	Z	Coef	Z
Age (omitted=12-23 months)								
Age = 24-35 months	-0.081	-1.31	-0.134	-2.06	-0.086	-1.50	-0.099	-1.77
Female	0.126	2.29	0.108	1.66	0.107	1.87	0.115	2.06
Age								
20-24	0.073	0.87	0.006	0.06	0.040	0.48	0.010	0.12
25-29	0.085	0.90	0.092	0.92	0.125	1.42	0.072	0.84
30-34	0.049	0.45	-0.035	-0.31	0.032	0.32	0.017	0.17
35-39	0.116	0.90	-0.053	-0.39	0.099	0.83	0.124	1.05
40-49	0.157	0.80	0.149	0.76	0.084	0.49	0.121	0.72
Mother's Education								
Primary	0.051	0.62	0.103	1.24	0.078	1.05	0.076	1.05
Secondary or above	0.004	0.04	-0.012	-0.11	0.021	0.21	0.037	0.39
Husband's Education								
Primary	0.106	1.16	0.055	0.60	0.134	1.64	0.110	1.38
Secondary or above	0.099	0.98	0.042	0.43	0.122	1.38	0.063	0.74
Quintile (omitted='poorest')								
2nd poorest	-0.172	-1.99	-0.082	-0.86	-0.144	-1.78	-0.191	-2.41
Middle	-0.099	-0.93	-0.100	-0.95	-0.132	-1.45	-0.128	-1.43
2nd richest	-0.153	-1.23	-0.166	-1.44	-0.195	-1.98	-0.161	-1.69
Richest	-0.307	-2.25	-0.285	-2.22	-0.304	-2.64	-0.305	-2.72
Division (omitted='Dhaka')								
Chittagong	-0.090	-0.48	-0.053	-0.47	-0.049	-0.50	-0.048	-0.49
Khulna/Barisal	0.158	0.85	0.143	1.28	0.181	1.82	0.117	1.21
Rajshahi	0.121	0.68	0.034	0.34	0.132	1.47	0.088	1.00
Sylhet	-0.053	-0.25	-0.039	-0.32	-0.020	-0.19	-0.117	-1.14
Distance								
RSDP Stat 0-1 km	-0.477	-1.83	-0.516	-3.64	-0.345	-2.82	-0.425	-3.54
RSDP Stat 2-5 km	-0.011	-0.09	-0.014	-0.19	-0.001	-0.01	-0.009	-0.14
RSDP Stat 5-10 km	-0.103	-0.52	-0.085	-0.74	-0.134	-1.33	-0.094	-0.95
RSDP Sat 0-1 km	0.020	0.05	-0.036	-0.14	0.173	0.75	0.137	0.60
RSDP Sat 2-5 km	0.017	0.04	-0.048	-0.17	0.110	0.45	0.191	0.79
RSDP Sat 5-10 km	-0.131	-0.29	-0.227	-0.78	-0.119	-0.46	-0.121	-0.48
Static clinic								
Price immunization	0.029	0.93	0.028	1.73	0.024	1.69	0.031	2.25
Equipment	0.011	0.73	0.012	1.54	0.008	1.20	0.014	2.08
Have doctor	0.164	1.05	0.094	1.02	0.204	2.49	0.083	1.04
Services	-0.050	-1.46	-0.034	-1.73	-0.039	-2.16	-0.046	-2.66
IEC	0.050	1.36	0.065	2.99	0.044	2.30	0.053	2.83
Satellite clinic								
Price immunization	0.034	0.35	0.090	1.50	0.048	0.94	0.049	0.96
Experience (years)	0.108	2.17	0.110	4.05	0.108	4.48	0.105	4.48
Services	-0.055	-1.06	-0.041	-1.47	-0.052	-2.08	-0.043	-1.75
Married	0.165	1.07	0.149	1.65	0.189	2.44	0.173	2.28
Intercept	0.826	0.73	0.396	0.61	0.509	0.89	0.427	0.75
Obs	2007		1643		2085		2151	
Wald chi2(34)	57		132.51		147.4		149.5	

Independent Variables	DPT3		Measles		Polio		BCG	
	Coef	Z	Coef	Z	Coef	Z	Coef	Z
Pseudo R2	0.054		0.0593		0.052		0.051	
Test								
Income	7.31	0.12	5.10	0.27	7.84	0.10	9.50	0.05
Distance Static	3.81	0.28	14.33	0.00	10.05	0.02	13.87	0.00
Distance Satellite	0.26	0.96	1.32	0.73	3.77	0.29	3.72	0.29
Static clinic	7.50	0.18	21.99	0.00	26.77	0.00	29.81	0.00
Satellite clinic	9.94	0.04	31.97	0.00	41.84	0.00	38.37	0.00

As noted in the 2001 RSDP Survey Report, the DPT and polio dropout rates were 35.8 percent and 12.8 percent respectively. Probit estimations examine the factors associated with children not receiving the full regimen of DPT and polio vaccinations (Table 4.7).

Proximity to RSDP satellite clinics, particularly being between 2 and 5 kilometers of an RSDP satellite – significantly increased the likelihood that a child will complete the full three polio vaccinations. Being in project areas also the likelihood of DPT dropout but only at the 20 percent level.

Few individual factors are associated with a greater likelihood of not completing the schedule of vaccinations, though girls are less likely to complete the full DPT regimen than boys and children in the highest asset quintile are more likely to complete the full regimen. Children in Khulna/Barisal and Rajshahi divisions are more likely to complete their vaccinations relative to children in Dhaka division.

Table 4.7 Probit Estimations of DPT3 and Polio Drop Outs

Independent Variables	DPT		Polio	
	Coef	Z	Coef	Z
Age 24-35 months	0.032	0.62	-0.140	-1.28
Female	0.125	2.43	0.126	1.22
Mother's Age				
20-24	-0.070	-1.03	0.100	0.66
25-29	-0.033	-0.45	0.104	0.66
30-34	0.085	0.92	0.303	1.62
35-39	0.113	1.02	0.169	0.70
40-49	-0.023	-0.15	-0.397	-0.92
Mother's Educ				
Primary	0.041	0.61	0.269	1.97
Secondary or Above	-0.115	-1.32	-0.055	-0.29
Father's Educ				
Primary	-0.042	-0.59	-0.145	-0.95
Secondary or Above	-0.080	-1.03	-0.207	-1.20
Asset Quintile				
2	-0.169	-2.31	-0.363	-2.42
3	-0.136	-1.69	-0.282	-1.57
4	-0.142	-1.69	-0.228	-1.25
Highest	-0.463	-4.36	-0.535	-2.57
Division				
Chittagong	-0.204	-1.65	-0.059	-0.28
Khulna/Barisal	-0.333	-2.51	-0.471	-1.85
Rajshahi	-0.622	-4.83	-0.550	-2.55
Sylhet	-0.175	-1.52	-0.091	-0.48
Distance				
Hospital 0-5 km	-0.587	-1.92	-0.659	-1.53
Hospital 5-10 km	0.149	1.04	-0.296	-1.03
THC 0-1 km	0.091	0.45	-0.082	-0.19
THC 2-5 km	0.032	0.26	-0.309	-1.46
THC 5-10 km	-0.071	-0.62	-0.345	-1.81
FWC 0-1 km	-0.166	-0.71	-0.389	-0.98
FWC 2-5 km	-0.172	-0.77	-0.274	-0.71
FWC 5-10 km	-0.126	-0.49	-0.310	-0.72
RSDP Stat 0-1 km	-0.172	-1.21	0.290	1.22
RSDP Stat 2-5 km	-0.050	-0.59	0.165	1.10
RSDP Stat 5-10 km	-0.193	-0.91	0.475	1.39
NGO Clinic 0-1 km	-0.587	-1.92	-0.659	-1.53
NGO Clinic 2-5 km	0.149	1.04	-0.296	-1.03
NGO Clinc 5-10 km	0.091	0.45	-0.082	-0.19
DH 0-1 km	0.032	0.26	-0.309	-1.46
DH 2-5 km	-0.071	-0.62	-0.345	-1.81
DH 5-10 km	-0.166	-0.71	-0.389	-0.98
RSDP Sat 0-1 km	-0.172	-0.77	-0.274	-0.71
RSDP Sat 2-5 km	-0.126	-0.49	-0.310	-0.72
RSDP Sat 5-10 km	-0.172	-1.21	0.290	1.22

Independent Variables	DPT		Polio	
	Coef	Z	Coef	Z
NGO Sat 0-1 km	-0.220	-1.94	-0.230	-1.24
NGO Sat 2-5 km	0.006	0.05	-0.008	-0.04
NGO Sat 5-10 km	-0.113	-1.16	-0.077	-0.47
Depotholder 0-1 km	-0.773	-3.45	-0.070	-0.11
Depotholder 2-5 km	-0.045	-0.43	0.083	0.50
Depotholder 5-10 km	-0.095	-0.98	0.043	0.28
RSDP Satellite 0-1 km	0.339	1.00	0.916	1.76
RSDP Satellite 2-5 km	0.430	1.37	0.700	1.36
RSDP Satellite-10 km	0.178	0.51	0.917	1.52
Other Satellite 0-1 km	-0.219	-0.83	-0.500	-1.45
Other Satellite 2-5 km	-0.216	-0.85	-0.830	-2.51
Other Satellite 5-10 km	-0.074	-0.28	-0.711	-1.94
Project Area	-0.216	-1.90	-0.261	-1.43
Intercept	0.007	0.07	-0.031	-0.17
Obs	2775		1057	
Wald chi2(43)	142.9		70.21	
Chi2 Tests				
Income	20.47	0.00	9.55	0.05
Stat Clinic Distance	2.05	0.56	2.98	0.39
Satellite Clinic Distance	1.45	0.69	6.89	0.08

As with childhood immunizations, the project appears to have had little impact on children's receipt of vitamin A in the 6 months prior to the survey or on the likelihood of illness (Table 4.8). The variables for proximity to RSDP static clinics, satellite clinics and depotholders do not bear any statistically significant relationship with receipt of vitamin A, ARI prevalence, diarrhea prevalence, or the use of ORS/labon gur for children with diarrhea. The dummy variable for project areas also bears no statistically significant relationship with child health outcomes.

At the individual and household level, older children are more likely to receive vitamin A than younger children, as are children in the second lowest and highest asset quintiles. Children in the middle and second highest asset quintiles are less likely to have symptoms of ARI. Children in the highest asset quintile are less likely to have diarrhea, but no more or less likely to receive ORS/labon gur. Boys and girls are equally likely to receive vitamin A and to experience basic illnesses. Children of more educated mothers are more likely to receive vitamin A. Father's educational level is associated with a lower likelihood of ARI but a higher likelihood of diarrhea. Children in Khulna/Barisal and Rajshahi divisions are more likely to receive vitamin A relative to children in Dhaka division. Children in Chittagong are more likely to have diarrhea and ARI than children in Dhaka division.

Table 4.8 Probit Estimations of Child Health

Independent Variables	Vitamin A		ARI		Diarrhea		ORS/ Laban Gur	
	Coef	Z	Coef	Z	Coef	Z	Coef	Z
Age								
24-35 months	0.719	17.67	-0.202	-4.43	-0.210	-3.43	0.278	1.32
36-47 months	0.723	19.31	-0.259	-5.79	-0.089	-1.50	0.152	0.86
48-59 months	0.737	17.45	-0.360	-6.74	-0.179	-2.51	0.002	0.01
Female	-0.008	-0.24	-0.047	-0.88	-0.037	-0.81	-0.084	-0.59
Mother's Age								
20-24	0.083	1.68	-0.164	-2.96	-0.053	-0.76	0.263	1.28
25-29	0.159	3.01	-0.109	-1.68	-0.039	-0.51	0.357	1.51
30-34	0.186	3.16	-0.022	-0.29	-0.062	-0.73	0.496	1.97
35-39	0.005	0.08	-0.072	-0.75	-0.075	-0.68	0.066	0.20
40-49	0.002	0.02	-0.067	-1.39	-0.090	-0.73	-0.048	-0.14
Mother's Educ								
Primary	0.088	2.00	-0.155	-2.16	0.030	0.48	-0.112	-0.70
Secondary or Above	0.180	3.21	0.134	2.79	-0.033	-0.40	0.057	0.21
Father's Educ								
Primary	0.004	0.10	0.109	1.81	0.149	2.29	0.139	0.77
Secondary or Above	0.066	1.26	-0.043	-0.81	0.025	0.35	0.310	1.29
Asset Quintile								
2	0.136	2.83	-0.091	-1.50	-0.007	-0.10	0.495	2.35
3	0.045	0.84	-0.200	-2.81	-0.068	-0.93	0.197	0.82
4	0.042	0.75	-0.291	-3.28	-0.121	-1.46	0.331	1.27
Richest	0.187	2.72	-0.054	-1.37	-0.176	-1.70	0.247	0.83
Division								
Chittagong	-0.065	-0.82	0.488	5.30	0.187	2.36	0.166	0.72
Khulna/Barisal	0.179	2.52	0.295	2.58	-0.190	-1.78	-0.334	-1.02
Rajshahi	0.306	4.46	0.081	0.79	0.002	0.03	0.275	0.96
Sylhet	-0.005	-0.07	0.076	0.76	0.130	1.64	0.037	0.18
Distance								
Hospital 0-5 km	0.286	1.92	0.125	0.56	-0.010	-0.06		
Hospital 5-10 km	-0.043	-0.51	0.172	1.34	-0.246	-1.97	-0.105	-0.27
THC 0-1 km	0.258	2.25	-0.179	-1.00	-0.079	-0.40	-0.177	-0.29
THC 2-5 km	0.083	1.01	0.092	0.90	0.082	0.89	0.207	0.80
THC 5-10 km	0.009	0.12	0.071	0.79	0.053	0.66	0.369	1.48
FWC 0-1 km	0.092	0.81	-0.063	-0.33	-0.082	-0.38	0.197	0.45
FWC 2-5 km	-0.005	-0.04	-0.075	-0.40	-0.017	-0.08	0.215	0.54
FWC 5-10 km	-0.030	-0.23	-0.058	-0.26	-0.040	-0.18	0.332	0.72
RSDP Stat 0-1 km	-0.163	-1.69	-0.107	-0.81	0.060	0.49	0.073	0.22
RSDP Stat 2-5 km	0.002	0.04	-0.132	-1.74	0.000	0.00	0.056	0.28
RSDP Stat 5-10 km	0.029	0.24	-0.175	-1.04	0.187	1.24	-0.645	-1.33
NGO Clinic 0-1 km	0.254	1.31	-0.226	-0.97	-0.119	-0.32	-0.165	-0.21
NGO Clinic 2-5 km	-0.070	-1.16	-0.069	-0.94	-0.106	-1.31	0.386	1.55
NGO Clinic 5-10 km	0.021	0.36	-0.214	-2.60	-0.142	-1.73	0.147	0.63
DH 0-1 km	0.004	0.03	0.037	0.16	0.120	0.49	0.688	1.08
DH 2-5 km	-0.052	-0.36	0.143	0.64	0.018	0.08	0.544	0.85
DH 5-10 km	-0.126	-0.69	-0.158	-0.65	0.173	0.57	0.065	0.09

Independent Variables	Vitamin A		ARI		Diarrhea		ORS/ Laban Gur	
	Coef	Z	Coef	Z	Coef	Z	Coef	Z
RSDP Sat 0-1 km	-0.057	-0.41	0.075	0.40	-0.224	-1.29	-0.090	-0.26
RSDP Sat 2-5 km	-0.024	-0.17	0.054	0.27	0.107	0.69	-0.115	-0.27
RSDP Sat 5-10 km	0.133	0.84	0.210	0.96	-0.352	-1.72	-0.542	-1.08
NGO Sat 0-1 km	0.041	0.61	0.127	1.24	-0.088	-0.85	-0.297	-1.08
NGO Sat 2-5 km	0.175	2.45	0.077	0.88	0.021	0.22	0.082	0.37
NGO Sat 5-10 km	0.158	2.17	-0.074	-0.85	0.011	0.13	-0.113	-0.52
Project Area	-0.097	-1.02	0.053	0.34	0.125	0.99	-0.329	-0.90
Intercept	-0.297	-2.55	-0.919	-4.39	-1.429	-5.51	-0.671	-0.96
Obs	7982		7982		7982		443	
Wald chi2(45)	918.7		200.93		82.77		45.37	
Pseudo R2	0.076		0.038		0.0263		0.1	
Chi2 Tests								
Quintiles	14.7	0.005	14.38	0.006	4.55	0.33	5.92	0.21
Distance Static Clinic	3.86	0.277	3.32	0.346	1.82	0.61	2.14	0.54
Distance Satellite Clinic	2.89	0.409	1.37	0.71	10.91	0.01	1.41	0.7

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